TABLE OF CONTENTS

TABLES

ACKNOWLEDGEMENTS

The Health Facilities Design Standards Committee (the Committee), formed under the guidance of the Division of Health Facilities and Services, Bureau of Health Systems of the Michigan Department of Consumer & Industry Services (MDCIS), was privileged to convene and work as an interdisciplinary committee to update the Minimum Design Standards for Health Care Facilities in Michigan (Design Standards).

From September of 1995 to January of 1998, the Committee of industry representatives worked diligently to update the Design Standards through monthly meetings. These updated Design Standards are the result of many hours of concentrated work by dedicated professionals concerned with the health care industry from private practice, professional organizations, and state agencies.

The Committee has rewritten certain portions of the standards to simplify them, to significantly reduce the volume of standards and to make them more useable by the design industry and health care delivery institutions.

Health Facilities Design Standards Committee

The Bureau wishes to express appreciation to the following designers, consultants and health care professionals who provided input to the Design Standards:

Committee Member	Sponsor
Stephen Q. Whitney, FAIA, Committee Chair Sr. V.P., Director of Health Care Services Albert Kahn Associates, Inc. 7430 Second Avenue Detroit, Michigan 48202-2798	American Institute of Architects AIA Michigan
Robert A. McCurdy, C.P.E., Committee Vice Chair Senior Project Engineer Detroit Medical Center 4707 St. Antoine Blvd. Detroit, Michigan 48201	Michigan Society for Healthcare Engineering
Allen L. Schoolcraft, P.E., Chief Bureau of Health Systems Health Facilities Evaluation Section 525 W. Ottawa, P.O. Box 30664 G. Mennen Williams Building - 5th Floor Lansing, Michigan 48909	MI Dept. of Consumer and Industry Services
James D. Scott, P.E. Bureau of Health Systems Health Facilities Evaluation Section 525 W. Ottawa, P.O. Box 30664 G. Mennen Williams Building - 5th Floor Lansing, Michigan 48909	MI Dept. of Consumer and Industry Services

David Guillaume Office of Fire Safety (MDCIS) 7150 Harris Drive Lansing, Michigan 48913	MI Dept. of Consumer and Industry Services
Judene Bartley, M.S., M.P.H., CIC Epidemiology Consulting Services, Inc. 17094 Dunblaine Beverly Hills, Michigan 48025-4102	1996-97 Guidelines Rev. Committee American Institute of Architects, Academy of Architecture for Health (AIA/AAH)
Pier-George Zanoni, P.E., Recording Secretary M.H.H.A. 6215 W. St. Joseph Hwy. Lansing, Michigan 48917	Michigan Health and Hospital Association
David Eilers Huron Memorial Hospital 1100 S. Van Dyke Bad Axe, Michigan 48413	Michigan Health and Hospital Association
Richard Gudkese Bay Medical Center 1900 Columbus Avenue Bay City, Michigan 48708	Michigan Health and Hospital Association
Teri L. Soper, RN, BSN, CIC Department Mgr., Infection Control E.W. Sparrow Health System 1215 East Michigan Avenue Lansing, Michigan 48909	Michigan Society of Infection Control
Robert S. Gazall, AIA Gazall, Reno & Associates 400 N. Saginaw, Suite 1 Flint, Michigan 48502	American Institute of Architects AIA Michigan
John R. Titus, P.E., President Tower, Pinkster, Titus, Associates 1000 S. Burdick St. Kalamazoo, Michigan 49001	Michigan Society of Professional Engineers (Mechanical)
Hebat Badiee, P.E. Enertech Engineering Company 1824 East Michigan Avenue, Suite 100 Lansing, Michigan 48912	Michigan Society of Professional Engineers (Mechanical)
Glenn Keates, P.E. Cummins and Barnard, Inc. 2058 South State Street Ann Arbor, Michigan 48104-4964	Michigan Society of Professional Engineers (Electrical)

Ronald A. Drake, P.E. Peter B. Haag Associates 4451 Copperhill Okemos, Michigan 48864	General Consultant
James J. Cole, Jr., Exec. V.P., AIC, CPC A.J. Etkin Construction Co. 30445 Northwestern Hwy., Suite 250 P.O. Box 9061 Farmington Hills, Michigan 48333-9061	Associated General Contractors of America Detroit Chapter
Marlyn Lundgren MAHSA 6215 W. St. Joseph Hwy. Lansing, Michigan 48917	MI Assoc of Homes & Services for the Aging
Donald Sharrard, Administrator Lake Orion Nursing Center 585 East Flint Street, P.O. Box 129 Lake Orion, Michigan 48361	Health Care Association of Michigan
Jeffrey L. McManus, P.E. Bureau of Health Systems Health Facilities Evaluation Section 525 W. Ottawa, P.O. Box 30664 G. Mennen Williams Building - 5th Floor Lansing, Michigan 48909	MI Dept. of Consumer and Industry Services
Kasra Zarbinian, P.E. Bureau of Health Systems Health Facilities Evaluation Section 525 W. Ottawa, P.O. Box 30664 G. Mennen Williams Building - 5th Floor Lansing, Michigan 48909	MI Dept. of Consumer and Industry Services
Robert Salkeld, Sanitarian Bureau of Health Systems Health Facilities Evaluation Section 525 W. Ottawa, P.O. Box 30664 G. Mennen Williams Building - 5th Floor Lansing, Michigan 48909	MI Dept. of Consumer and Industry Services

Long Term Care Subcommittee

Kasra Zarbinian, P.E.
Bureau of Health Systems
Health Facilities Evaluation Section
525 W. Ottawa, P.O. Box 30664
G. Mennen Williams Building - 5th Floor
Lansing, Michigan 48909

MI Dept. of Consumer and Industry Services

David Guillaume
Office of Fire Safety (MDCIS)
7150 Harris Drive
Lansing, Michigan 48913

MI Dept. of Consumer and Industry Services

Pier-George Zanoni, P.E., Recording Secretary
M.H.H.A.
6215 W. St. Joseph Hwy.
Lansing, Michigan 48917

Michigan Health and Hospital Association

Robert S. Gazall, AIA
Gazall, Reno & Associates
400 N. Saginaw, Suite 1
Flint, Michigan 48502

American Institute of Architects AIA Michigan

Donald Sharrard, Administrator
Lake Orion Nursing Center
585 East Flint Street, P.O. Box 129
Lake Orion, Michigan 48361

Health Care Association of Michigan

Cherie-Nan Jansen, RN, BSN, MPH
2364 Woodlake Circle, Suite 180
Okemos, Michigan 48864

Michigan Public Health Institute

Cheryl Riskin
13323 Borgman
Huntingwoods, Michigan 48070

MI Assoc of Homes & Services for the Aging

Shari Carson
4000 N. Michigan Road
Dimondale, Michigan 48821

St. Lawrence Dimondale Center

Les Stauske
Martin Luther Memorial Home
5091 Willoughby
Holt, Michigan 48842

MI Assoc of Homes & Services for the Aging

Paul R. Thompson, Jr.
26505 Powers Avenue
Dearborn Heights, Michigan 48125

DMC Nursing Centers

Fred Hough
1000 Diana
Ludington, Michigan 49431

Oakview Medical Care Facility

Mark A. Oswald
1413 Gratiot
Saginaw, Michigan 48602

Saginaw Geriatrics Home

Special thanks are due to the Division of Health Facilities and Services, Bureau of Health Systems of the Michigan Department of Consumer & Industry Services, which provided funding and personnel support for this effort.

Stephen Q. Whitney, FAIA
Committee Chair
Health Facilities Design Standards Committee

FOREWORD

This marks the first update since 1978 of Design Standards mandated by the Public Health Code (Sec. 21523). These Standards were entitled Minimum Requirements of Construction and Equipment of Hospital and Medical Facilities, U.S. Department of Health, Education, and Welfare (DHEW) Publication No. (HRA) 74-4000 (reprint 76-4000), as modified by Addendum by the Michigan Department of Public Health on November 8, 1978.

The constant changes to health care systems have required the development of numerous informal guidelines, clarifications, and standards since 1978 to address public health issues in the design of facilities and systems which the Bureau regulates. These documents have, with a few exceptions, been replaced by these updated Design Standards. Attached is a listing of those documents, which have been replaced completely or in part by the updated Design Standards.

The basis for these Design Standards originated with the nationally recognized Guidelines for Design and Construction of Hospital and Health Care Facilities, 1996-97 Edition (published by the American Institute of Architects Academy of Architecture for Health (AIA/AAH), with assistance from the U.S. Department of Health and Human Services). The Guidelines have been accepted by the Joint Commission on Accreditation of Healthcare Organizations, the American Hospital Association, and the Health Care Financing Administration (HCFA) representing the Medicare program.

PREVIOUS DESIGN STANDARDS

This list of rules, recommendations, and minimum standards governing the design and construction of health care facilities in Michigan has been replaced completely or in part by the updated Design Standards:

* Minimum Standards of Construction and Equipment for Hospitals and Medical Care Facilities - HEW Publication No. (HRA) 74-4000 or 76-4000, with Addendum developed by the Michigan Department of Public Health and Physical Plant Advisory Committee, November 8, 1978.
* Department of Public Health Rules and Minimum Standards for Hospitals, Renumbered 11/86.
* Department of Public Health - Bureau of Health Facilities, Nursing Home and Nursing Care Facilities, January 23, 1987.
* Department of Public Health, Division of Health Facility Standards and Licensing, Homes for the Aged, July 25, 1968.
* Freestanding Surgical Outpatient Facilities, Division of Health Facility Standards and Licensing, January, 1987.
* Illumination Engineering Society (I.E.S.) 1981 Standards, as modified by the Michigan Department of Public Health and published in the October/December 1984 Newsletter.
* Recommendations for Development of LDRP and Birthing Rooms, LC-521 (3/90).
* Recommendations for Mobile Cardiac Catheterization Units, Michigan Department of Public Health (12/91).
* Installation Recommendations for Traveling Mobile Units, Michigan Department of Public Health (9/88).
* Recommendations for Development of an ESRD, Michigan Department of Public Health LC-522 (4/96).

* Clarification for Installation and Cleaning of Furniture and Equipment in Health Care Facilities (5/8/96).
* MDCIS Requirements-Emergency Fuel and Water Supply for Hospitals, LC-517 (1/93).
* Corridor Chart Box Standards (11/96).
* MDCIS-Ventilation of Isolation Rooms to Prevent or Reduce Employee Exposure to TB Bacilli in Nursing Homes. (8/97)

1. INTRODUCTION

1.1. General

1.1.A. This document contains information intended as minimum design standards for health care facilities in Michigan. Details of architecture and engineering are part of good design practice and local building regulations. Design of new and renovated facilities shall conform to the requirements of these Standards. Requirements set forth in these Standards shall be considered as minimum.

An asterisk (*) preceding a paragraph number indicates that explanatory or educational material can be found in Appendix A.

1.1.B. The Health Care Financing Administration, which is responsible for Medicare and Medicaid reimbursement, has adopted the National Fire Protection Association 101 Life Safety Code (NFPA 101). Facilities participating in Medicare and Medicaid programs shall comply with that code.

1.1.C. The health-care provider shall supply for each project an operational narrative as outlined in MDCIS publication LC-550. Those services available elsewhere in the institution or community need not be duplicated in the facility. The operational narrative shall also address the potential future expansion of essential services which may be needed to accommodate increased demand. The operational narrative shall be made available for use in the development of project design and construction documents.

1.2. Renovation

1.2.A. Where renovation or replacement work is done within an existing licensed facility, all new work or additions, or both, shall comply with applicable sections of these Standards, the State of Michigan Barrier Free Design Rules, appropriate parts of the State of Michigan Fire Safety Rules covering new Health Care Occupancies, and with all applicable local rules and ordinances.

Exception: Where building conditions occur in an existing licensed facility, and all supporting rooms, areas or equipment outlined in these Standards cannot be reasonably accommodated, the Michigan Department of Consumer and Industry Services (MDCIS) may grant approval to deviate from the design standards if:

1. The facility in question is currently in operation,

2. The licensure status of the facility is not proposed to change,

3. The existing facility meets current fire safety rules, or is approved for continued operation by the Michigan Office of Fire Safety, and

4. An operational narrative is provided which:

    a. Indicates those rooms, areas, or equipment that cannot be accommodated;

b. Indicates all building constraints that preclude inclusion of specific elements; and

c. Indicates option(s) that can be provided to support the service or activity without compromising patient care or safety.

1.2.B. In renovation projects and those making additions to existing facilities, only that portion of the total facility affected by the project shall be required to comply with applicable sections of the Standards and with appropriate parts of NFPA 101 covering New Health Care Occupancies.

1.2.C. Those existing portions of the facility which are not included in the renovation, but which are essential to the functioning of the complete facility, as well as existing building areas that receive less than substantial amounts of new work shall, at a minimum, comply with that section of NFPA 101 for Existing Health Care Occupancies.

***1.2.D.** Renovations, including new additions, shall not diminish the safety level that existed prior to the start of the work; however, safety in excess of that required for new facilities is not required.

*1.3. Design Standards for the Disabled

Health care facility construction shall meet the Barrier Free Design Requirements of the Michigan Building Code Rules incorporating the 1993 Edition of the BOCA National Building Code, effective May 17, 1997.

*1.4. Provisions for Disasters

In locations where there is recognized potential for hurricanes, tornadoes, flooding, earthquake, or other regional disasters, planning and design shall consider the need to protect the life safety of all health care facility occupants and the potential need for continuing services following such a disaster.

*1.4.A. Wind and Earthquake Resistant Design for New Buildings

Facilities shall be designed to meet the requirements of the local building codes provided these requirements are substantially equivalent to ASCE 7-93.

1.5. Codes and Standards

NFPA's standards, especially the NFPA 101, are the basic codes of reference, but other codes and/or standards may be included as part of these standards. In the absence of state or local requirements, the project shall comply with approved nationally recognized building codes except as modified in the latest edition of the NFPA 101, and/or herein.

1.5.A. Equivalency

Insofar as practical, these minimum Standards have been established to obtain a desired performance result. Prescriptive limitations, when given, such as exact minimum dimensions or quantities, describe a condition that is commonly recognized as a minimum practical standard for normal operation.

In all cases where specific limits are described, equivalent solutions will be acceptable if the MDCIS approves them as meeting the intent of these Standards. Nothing in this document shall be construed as restricting innovations that provide an equivalent level of performance with these Standards in a manner other than that which is prescribed by this document, provided that no other safety element or system is compromised in order to establish equivalency.

National Fire Protection Association (NFPA) document 101A is a technical standard for evaluating equivalency to certain Life Safety Code 101 requirements. The Fire Safety Evaluation System (FSES) has become widely recognized as a method for establishing a safety level equivalent to the Life Safety Code. It may be useful for evaluating existing facilities that will be affected by renovation. The FSES is not intended to be used for new construction.

1.5.B. English/Metric Measurements

Metric standards of measurement are the norm for most international commerce and are being used increasingly in health facilities in the United States. Where measurements are a part of this document, English units are given as the basic standards with metric units in parenthesis.

*1.5.C. List of Referenced Codes and Standards

Codes and standards which have been referenced in whole, or in part, in the various sections of this document are listed in the Appendix. Names and addresses of originators are also included for information. The issues available at the time of publication are used. Later issues, if used in their entirety, will normally be acceptable where requirements for function and safety are not reduced; however, editions of different dates may have portions renumbered or retitled. Care must be taken to insure that appropriate sections are used.

*1.5.D. Availability of Codes and Standards

Copies of publications can be obtained at the addresses listed in the Appendix.

2. DEFINITIONS

2.1. General

2.1.A. **Handwashing facilities** shall be basins with minimum dimensions of 12 inches (30 cm) x 12 inches (30 cm) x 6 inches (15 cm) deep to wash hands. Each basin shall be equipped with hot and cold water supplied through trim such as gooseneck inlets or other types of inlets which discharge at a point at least 5 inches (13 cm) above the rim of the basin and controls which can be operated without the use of hands. Where wrist blades are provided, they shall be at least 4 inches (10.2 cm) in length. Soap and a system to dry hands shall be provided at each handwashing facility.

Handwashing facilities shall be located at least 36 inches (91 cm) from patients or storage of clean/sterile materials or shall be equipped with splash guards so as to avoid splash contamination.

Handwashing facilities and lavatories shall be securely anchored to withstand an applied vertical load of not less than 250 pounds (113.4 kilograms) on the fixture front.

Handwashing facilities shall be provided at all locations where invasive patient activities may take place, where product protection is necessary, or where individuals may need to minimize hazards from chemical or microbial exposure.

1. Handwashing facilities shall be provided in, though not limited to, the following areas:

    a. Nourishment & food preparation areas;

    b. Soiled work rooms;

    c. Laboratories where chemical or microbial materials may be present;

    d. Areas where staff have direct physical contact with patients (except in operating rooms and delivery rooms);

    e. Areas or rooms where staff carry out an invasive activity, such as drawing blood, or starting an IV;

    f. Areas or rooms where clean or sterile items may be set up or manipulated;

    g. Pharmacies and medicine preparation rooms;

    h. Resident and patient dining rooms;

    i. Both toilet rooms and patient rooms in acute care facilities;

    j. Either toilet rooms or resident rooms in long term care facilities.

2. Handwashing facilities shall be conveniently located as follows:

   a. Within a 15 foot (4.6 meters) travel distance of all inpatient (including outpatient PACU) bassinet, bed, stretcher, and examination/treatment locations;

   b. Within a 25 foot (7.6 meters) travel distance of all outpatient chair, stretcher, and examination/treatment locations, where patient care medication/materials are assembled, where food is prepared, or where toxic, potentially infectious, or otherwise hazardous materials are routinely handled;

   c. Within the same room or space; and

   d. In clear unobstructed areas, not hidden behind cubicle curtains, columns, or doors, or in areas which are used for equipment/material storage.

2.1.B. **New construction** means creation of new architectural space outside of the confines of existing floors, walls, and roofs.

2.1.C. **Patient holding areas**, including preoperative holding and post-anesthesia care units, (recovery) shall provide the following:

1. A minimum of 100 square feet (9.3 square meters) of clear floor area shall be provided per bed or stretcher that is located in a single-bed room.

2. A minimum of 80 square feet (7.4 square meters) of clear floor area shall be provided per bed or stretcher that is located in a multiple-bed room.

3. A minimum of 50 square feet (4.6 square meters) of clear floor area shall be provided per chair that is located in a multiple-chair room.

4. A minimum of 4 feet (1.2 meters) of clear space shall be provided at the foot of a bed, stretcher or chair in multiple patient rooms as an aisle for equipment access.

5. A minimum of 4 feet (1.2 meters) shall be provided between beds, stretchers or chairs, and a minimum of 4 feet (1.2 meters) shall be provided between an adjacent wall and the side of a bed, stretcher or chair.

6. Provisions for airborne infection isolation shall be determined by the Infection Control Risk Assessment Group consistent with Section 2.1.G.

7. Cubicle curtains shall be provided for each patient station in a multiple station room, for privacy.

8. Patient areas shall be under the visual control of the nursing staff. (See A7.3.A11.)

9. Handwashing facilities shall be provided consistent with Section 2.1.A.

10. Patient toilet facilities at a ratio of one per eight patient stations, or fraction thereof, shall be provided in holding, recovery, or treatment areas where patients are ambulatory. These toilet facilities must be accessible without entering a general corridor.

11. Support spaces such as nurse station, clean utility, soiled utility, nourishment, medication, stretcher storage and housekeeping rooms shall be provided consistent with Section 2.1.H.

12. Staff toilet facilities shall be provided convenient to the area.

2.1.D. (Not Used)

2.1.E. **Renovation** means any change of walls or partitions within an existing building to create a new architectural configuration or modification to the mechanical, electrical, or plumbing system that significantly changes the design, routing or capacity of the system. Items of normal building maintenance, repair, upkeep, or replacement with similar equipment are not considered renovation. Renovation of 50 percent or more of a department, floor, wing or building will require the entire department, floor, wing or building to meet these standards.

2.1.F. Equipment Installation

1. Equipment, unless readily movable, shall be:

   a. Sealed to the floor;

   b. Installed on a raised platform in a way that meets all the requirements for sealing or floor clearance; or

   c. Elevated on legs, mounted on walls, or suspended from the ceiling, to provide at least a 6-inch (13 cm) clearance between the floor and the equipment.

2. Equipment is readily movable if:

   a. It is mounted on wheels or casters; and

   b. It has no utility connection or has a utility connection that disconnects quickly, or has a flexible utility line of sufficient length to permit the equipment to be moved for easy cleaning.

   c. It is suspended on a wall by brackets and can be lifted off of the wall by a device which can be operated by housekeeping personnel for cleaning purposes.

3. Unless sufficient space is provided for easy cleaning between, behind and above each unit of fixed equipment, the space between it and adjoining equipment units and adjacent walls or ceilings shall be not more than 1/32 inch (0.8 mm); or if exposed to seepage (or contamination), the equipment shall be sealed to the adjoining equipment or adjacent walls or ceilings.

***2.1.G.** **Infection Control Risk Assessment** is the assessment carried out by a multidisciplinary group designated to determine the number of rooms required to prevent and control communicable disease or protect severely immunosuppressed patients in the facility. Numbers of air-borne infection isolation rooms or need for a protected environment are based on prevalence of communicable disease in the community and the health system's patient population and programs.

(See Table 2A and footnotes for ventilation requirements for isolation rooms.)

2.1.H. Service Areas

The services listed below shall be provided in each nursing unit. These services shall be in or readily available to each patient module. The size and location of each service area will depend upon the numbers and types of beds served. Identifiable spaces are required for each of the indicated functions. Each service area may be arranged and located to serve more than one patient module but, unless noted otherwise, at least one such service area shall be provided on each nursing unit. Where the words "room" or "office" are used, a separate, enclosed space for the named function is intended; otherwise, the described area may be a specific space in another room or common area.

*1. Administrative center or nurse station

2. Toilet room(s) conveniently located for staff use (may be unisex). A staff toilet room shall be provided on each nursing floor.

3. Securable closets or cabinet compartments for the personal articles of unit staff located in or near the nurse station, staff workroom, or lounge. At a minimum, these shall be large enough for purses and billfolds. Coats may be stored in closets or cabinets on each floor or in a central staff locker area.

4. Multipurpose room(s) for staff, patients, patients' families for patient conferences, reports, education, training sessions, and consultation. These rooms must be accessible to each nursing unit. They may be on other floors if convenient for regular use. One such room may serve several nursing units and/or departments.

5. Examination/treatment room(s). Such rooms may be omitted if all patient rooms in the nursing unit are single-bed rooms. Centrally located examination and treatment room(s) may serve more than one nursing unit. They may be located on other floors if convenient for regular use. Such rooms shall have a minimum clear floor area of 120 square feet (11.2 square meters).

6. Clean workroom or clean supply room. If the room is used for preparing patient care items, it shall contain a work counter and storage facilities for clean and sterile supplies. If the room is used only for storage and holding as part of a system for distribution of clean and sterile materials, the work counter may be omitted. Soiled and clean workrooms or holding rooms shall be separated and have no direct connection.

7. Soiled workroom or soiled holding room. This room shall be separate from the clean workroom. The soiled workroom shall contain a clinical sink. The room shall have a work counter and space for separate covered containers for soiled linen and waste. Additional rooms used only for temporary holding of soiled material may omit the clinical sink and work counter.

8. Medication station. Provision shall be made for distribution of medications. This may be done from a medicine preparation room or unit, from a self-contained medicine dispensing unit, or by another approved system.

    a. Medicine preparation room. This room shall be under visual control of the nursing staff. It shall contain a work counter, refrigerator, and locked storage for controlled drugs. When a medicine preparation room is to be used to store one or more self-contained medicine dispensing units, the room shall be designed with adequate space to prepare medicines with the self-contained medicine dispensing unit(s) present.

    b. Self-contained medicine dispensing unit. A self-contained medicine dispensing unit may be located at the nurse station, in the clean workroom, or in an alcove, provided the unit has adequate security for controlled drugs and adequate lighting to easily identify drugs.

9. Clean linen storage. Each nursing unit shall contain a designated area for clean linen storage. This may be within the clean workroom, a separate closet, or an approved distribution system on each floor.

10. Nourishment station. There shall be a nourishment station with sink, work counter, refrigerator, storage cabinets, and equipment for hot and cold nourishments between scheduled meals. The nourishment station shall include space for trays and dishes used for nonscheduled meal service. Provisions and space shall be included for separate temporary storage of unused and soiled dietary trays not picked up at meal time.

11. Ice machine. Each nursing unit shall have equipment to provide ice for treatments and nourishment. Ice-making equipment may be in the clean work room/holding room or at the nourishment station. Ice intended for human consumption shall be from self-dispensing ice makers.

12. Equipment storage room. Appropriate room(s) shall be provided for storage of equipment necessary for patient care and as required by the operational narrative. This room may serve more than one unit on the same floor.

13. Storage space for stretchers and wheelchairs shall be provided in a strategic location, without restricting normal traffic.

14. Central bathing facilities, including space for attendant, shall be provided for patients on stretchers, carts, and wheelchairs at the ratio of one per 100 beds or a fraction thereof. This may be on a separate floor, if convenient for use. Each bathtub or shower shall be in an individual room or enclosure that provides privacy for bathing, drying, and dressing. A patient toilet room shall communicate directly to each central bathing facility.

15. Patient toilet room(s), in addition to those serving bed areas, shall be conveniently located to multipurpose room(s). Patient toilet rooms may be unisex. Patient toilet rooms serving multipurpose rooms may also be designated for public use.

16. Emergency equipment storage. Space shall be provided for emergency equipment that is under direct control of the nursing staff, such as a cardiopulmonary resuscitation (CPR) cart. This space shall be located in an area that is convenient for the nursing staff, but out of normal traffic, as described in the operational narrative.

17. Housekeeping room. A housekeeping room shall be provided convenient to each nursing unit or departmental unit. It shall be directly accessible from the unit and may serve more than one unit on a floor. It shall contain a service sink or floor receptor and provisions for all routinely used supplies and housekeeping equipment.

18. Dictation. An area with a work surface separate from the nurse station shall be provided.

19. Nurse or supervisor office(s).

*20. Charting function consistent with the operational narrative. Charting facilities shall not obstruct corridors.

21. Staff lounge facilities shall be provided. These facilities may be on another floor.

2.1.I. Surgical Recovery Units

1. Post Anesthesia Care (or Phase/Stage 1 Recovery) Unit means a room or ward where the patient transitions from a totally anesthetized state to one requiring less acute interventions. Prior to discharge from this unit, the patient has been fully stabilized.

2. Phase/Stage 2 Recovery Unit means a room or ward where outpatients prepare to care for themselves or to be cared for in an extended care facility.

2.1.J. **Nursing Unit** means a patient care area of a facility which includes patient sleeping rooms, support areas, and staff areas. A nursing unit is limited to one floor and/or wing of a building. The nursing unit includes one or more patient modules.

2.1.K. **Patient Module** means a unit of a health care facility made up of one or more patient sleeping rooms which are served from a single staff location.

2.1.L. **Resident Units** are groups of resident rooms, staff work areas, service areas and resident support areas, whose size and configuration are based upon organizational patterns of staffing, functional operations and communications, as provided in the operational narrative for the facility.

3. SITE

3.1. Location

3.1.A. (Not Used)

*3.1.B. (Not Used)

3.1.C. (Not Used)

3.1.D. Availability of Utilities

Facilities shall be located to provide reliable community utilities (water, gas, sewer, electricity). The water supply shall have the capacity to provide normal usage plus fire-fighting requirements. At least two service lines shall be provided to the facility. These water lines shall be valved so that water will continue to be provided to the hospital in the event of disruption of the water line on one side of the valve. An approved well can be an acceptable secondary source of water. The electricity shall be of stable voltage and frequency.

When a public sanitary sewage system is not available and a private liquid wastewater disposal system is used, the system shall be approved by the department and shall comply with all applicable laws.

For PROPOSED facilities, approved by the department means:

1. A wastewater stabilization lagoon or an approved "package" treatment plant with the effluent discharging to the surface or ground waters of the State, which complies with the following:

    a. Designed consistent with the "Recommended Standards for Wastewater Facilities" adopted by the Great Lakes-Upper Mississippi River Board of State and Provincial, Public Health and Environmental Managers, 1997 edition;

    b. Has received a "discharge permit" from the Michigan Department of Environmental Quality.

2. A subsurface disposal system (septic tank and tile field) is not acceptable.

3.2. Facility Site Design

3.2.A. Roads

Paved roads shall be provided within the property for access to all entrances and to loading and unloading docks (for delivery trucks). Hospitals with an organized emergency service shall have the emergency access well marked to facilitate entry from the public roads or streets serving the site. Other vehicular or pedestrian traffic shall not

conflict with access to the emergency service. In addition, access to emergency services shall be located to incur minimal damage from floods and other natural disasters. Paved walkways shall be provided for pedestrian traffic.

3.2.B. (Not Used)

3.3. Environmental Pollution Control

3.3.A. (Not Used)

3.3.B. (Not Used)

4. EQUIPMENT

4.1. General

4.1.A. (Not Used)

***4.1.B.** The drawings shall indicate provisions for the installation of equipment that requires dedicated building services, or special structures, or that illustrate a major function of the space. Adjustments shall be made to the construction documents when final selections are made.

4.1.C. Space for accessing and servicing fixed and building service equipment shall be provided in accordance with manufacturer's recommendations.

4.1.D. Some equipment may not be included in the construction contract, but may require coordination during construction. Such equipment shall be shown in the construction documents as owner-provided or not-in-contract for purposes of coordination.

4.2. Classification

Equipment will vary to suit individual construction projects and therefore will require careful planning. Equipment to be used in projects shall be classified as building service equipment, fixed equipment, or movable equipment.

4.2.A. Building Service Equipment

Building service equipment shall include such items as heating, air conditioning, ventilation, humidification, filtration, chillers, electrical power distribution, emergency power generation, energy/utility management systems, conveying systems, and other equipment with a primary function of building service.

4.2.B. Fixed Equipment (Medical and Nonmedical)

4.2.B1. Fixed equipment includes items that are permanently affixed to the building or permanently connected to a service distribution system that is designed and installed for the specific use of the equipment. Fixed equipment may require special structural designs, electromechanical requirements, or other considerations.

a. Fixed medical equipment includes, but is not limited to, such items as fume hoods, sterilizers, communication systems, built-in casework, imaging equipment, radiotherapy equipment, lithotripters, hydrotherapy tanks, audiometry testing chambers, and lights.

b. Fixed nonmedical equipment includes, but is not limited to, items such as walk-in refrigerators, kitchen cooking equipment, serving lines, conveyors, mainframe computers, laundry, and similar equipment.

4.2.C. Movable Equipment (Medical and Nonmedical)

4.2.C1. Movable equipment includes items that require floor space or electrical and/or mechanical connections but are portable, such as wheeled items, portable items, office-type furnishings, and monitoring equipment. Movable equipment may require special structural design, electromechanical connections, shielding, or other considerations.

a. Movable medical equipment includes, but is not limited to, portable X-ray, electroencephalogram (EEG), electrocardiogram (EKG), treadmill and exercise equipment, pulmonary function equipment, operating tables, laboratory centrifuges, examination and treatment tables, and similar equipment.

b. Movable nonmedical equipment includes, but is not limited to, personal computer stations, patient room furnishings, food service carts, case carts and distribution carts, and other portable equipment.

***4.3. Major Technical Equipment**

Major technical equipment is specialized equipment (medical or nonmedical) that is customarily installed by the manufacturer or vendor. Since major technical equipment may require special structural designs, electromechanical requirements, or other considerations, close coordination between owner, building designer, installer, construction contractors, and others is required.

5. CONSTRUCTION

*5.1. Planning and Design

Continual facility upgrades through renovation and new construction of health care facilities can create conditions which can be hazardous to patients. Control for clean to dirty airflow, interruption of utility and/or building/equipment services, and communication requirements shall be specified in the project bid documents in order to ensure construction specification compliance. Any temporary relocation of services during construction shall be described in the operational narrative.

Design and planning for such projects in the health care facilities shall require consultation from infection control professionals and safety personnel. Early involvement in the conceptual phase will help ascertain the risk assessment for susceptible patient location and disruption of essential patient services.

*5.2. Phasing

Projects involving renovation of existing buildings shall include phasing to minimize disruption of existing patient services. This phasing is essential to ensure a safe environment in patient care areas. Phasing will include assurance for clean to dirty airflow, emergency procedures, criteria for interruption of services, construction of roof surfaces, written notification of interruptions, and communication authority. Noise and vibration will affect patients and procedures and shall be planned for accordingly. The renovation areas shall be isolated from the occupied areas during construction using airtight barriers which meet the requirements of the Office of Fire Safety. Exhaust airflow shall be sufficient to maintain negative air pressure in the construction zone. Air quality requirements shall be maintained as described in Tables 2 and 6. All such precautions shall be described in the operational narrative.

5.3. Commissioning

Acceptance criteria for mechanical systems shall be specified. Crucial ventilation specifications for air balance and filtration shall be verified before Owner acceptance. Areas requiring special ventilation include surgical services, protective environments, airborne infection isolation rooms, laboratories, and local exhaust systems for hazardous agents. These areas shall be recognized as requiring mechanical systems that ensure infection control, and ventilation deficiencies shall not be accepted. Acceptance criteria for local exhaust systems dealing with hazardous agents shall be specified and verified.

5.4. Existing Conditions

Existing conditions and operations shall be documented prior to initiation of renovation projects, including the existing mechanical/electrical capacities and quantities.

6. RECORD DRAWINGS AND MANUALS

6.1. Drawings

Drawings shall include a fire protection plan for each floor reflecting NFPA 101 requirements.

6.2. Equipment Manuals

Upon completion of the contract, the owner shall be furnished with a complete set of manufacturers' operating, maintenance, and preventive maintenance instructions; parts lists; and procurement information with numbers and a description for each piece of equipment. Operating staff shall also be provided with instructions on how to properly operate systems and equipment. Required information shall include energy ratings, as needed for future conservation calculations.

6.3. Design Data

The owners shall be provided with complete design data for the facility. This shall include structural design loadings; summary of heat loss assumption and calculations; estimated water consumption; medical gas outlet listing; list of applicable codes; and electric power requirements of installed equipment. All such data shall be supplied to facilitate future alterations, additions, and changes, including, but not limited to, energy audits and retrofit for energy conservation.

7. GENERAL HOSPITAL

7.1. General Considerations

7.1.A. Functions

There shall be for each project an operational narrative for the facility consistent with Section 1.1.C.

7.1.B. Standards

The general hospital shall meet all the standards described herein. Deviations shall be described and justified in the operational narrative for specific approval by the MDCIS.

7.1.C. Sizes

Department size and clear floor areas will depend upon program requirements and organization of services within the hospital. Some functions may be combined or shared, providing the layout does not compromise safety standards and medical and nursing practices.

7.1.D. Parking

Each new facility, major addition, or major change in function shall have parking space to satisfy the needs of patients, personnel, and public. A formal parking study is desirable. In the absence of such a study, provide one space for each bed plus one space for each employee normally present on any single weekday shift. Additional parking shall be required to accommodate outpatient and other services. Separate and additional space shall be provided for service delivery vehicles and vehicles utilized for emergency patients.

*7.1.E. Swing Beds (Not Used)

7.2. Nursing Unit (Medical and Surgical)

See other sections of this document for special-care area units, such as recovery rooms, critical care units, pediatric units, rehabilitation units, and skilled nursing care or other specialty units.

Each nursing unit shall include the following (see Section 1.2 for waiver of standards where existing conditions make absolute compliance impractical).

7.2.A. Patient Rooms

Each patient room shall meet the following standards.

7.2.A1. Maximum room capacity shall be two patients. Where renovation work is undertaken and the present capacity is more than two patients, maximum room capacity shall be no more than the present capacity with a maximum of four patients.

*7.2.A2. In new construction, patient rooms shall have a **minimum** of 100 square feet (9.3 square meters) of clear floor area per bed in multiple-bed rooms and 120 square feet (11.2 square meters) of clear floor area for single-bed rooms, exclusive of toilet rooms, closets, lockers, wardrobes, alcoves, or vestibules. The dimensions and arrangement of rooms shall be such that there is a minimum of 3 feet (0.91 meter) between the sides and foot of the bed and any wall or any other fixed obstruction. In multiple-bed rooms, a clearance of 4 feet (1.22 meters) shall be available at the foot of each bed to permit the passage of equipment and beds. Minor encroachments, including columns and lavatories, that do not interfere with functions may be ignored when determining space requirements for patient rooms. Where renovation work is undertaken, every effort shall be made to meet the above **minimum** standards. If it is not possible to meet the above square-foot standards, the MDCIS may grant approval to deviate from this requirement. In such cases, patient rooms shall have no less than 80 square feet (7.4 square meters) of clear floor area per bed in multiple-bed areas and 100 square feet (9.3 square meters) of clear floor area in single-bed rooms.

*7.2.A3. Each patient room shall have a window consistent with Section 7.28.A10.

7.2.A4. (Not Used)

7.2.A5. Each patient shall have access to a toilet room without having to enter the general corridor area. One toilet room shall serve no more than four beds and no more than two patient rooms. The toilet room shall contain a water closet and a handwashing facility, and the door shall swing outward or be double-acting.

7.2.A6. Each patient shall have within his or her room a separate wardrobe, locker, or closet suitable for hanging full-length garments and for storing personal effects.

7.2.A7. In multiple-bed rooms, visual privacy from casual observation by other patients and visitors shall be provided for each patient. The design for privacy shall not restrict patient access to the entrance, lavatory, or toilet room.

7.2.B. **Service Areas** shall be provided consistent with the requirements of Section 2.1.H.

***7.2.C. Airborne Infection Isolation Room(s)**

7.2.C1. At least one airborne infection isolation room shall be provided. The number of airborne infection isolation rooms for individual patient units shall be increased based upon an "infection control risk assessment" prepared by a multidisciplinary group designated for that purpose. These rooms may be located within individual nursing units and used for normal acute care when not required for isolation cases or they may be grouped as a separate isolation unit. Each room shall contain only one bed and shall comply with the acute-care patient room section of this document, as well as the following.

7.2.C2. Each airborne infection isolation room shall have an area for handwashing, gowning, and storage of clean and soiled materials located directly outside or immediately inside the entry door to the room.

7.2.C3. Airborne infection isolation room floors and perimeter walls above and below the ceiling, including penetrations, shall be sealed tightly.

7.2.C4. Airborne infection isolation room(s) shall have self-closing devices on all room exit doors.

7.2.C5. Separate water closet, bathtub (or shower), and handwashing facilities are required for each airborne infection isolation room.

7.2.C6. (Not Used)

***7.2.D. Protective Environment Rooms (Not Used)**

7.2.E. Seclusion Room(s)

The hospital shall provide one or more single-bed rooms for patients needing close supervision for medical and/or psychiatric care. If the single-bed room(s) is part of the acute-care nursing unit, the provisions of Section 7.6.A. shall apply, with the following exceptions: each room shall be for single occupancy; each shall be located to permit staff observation of the entrance, preferably adjacent to the nurse station; and each shall be designed to minimize the potential for escape, hiding, injury, or suicide. If vision panels are used for observation of patients, the arrangement shall insure patient privacy and prevent casual observation by visitors and other patients.

7.3. Critical Care Units

The critical care units require special space and equipment considerations for effective staff functions. In addition, space arrangement shall include provisions for immediate access of emergency equipment from other departments.

Not every hospital will provide all types of critical care. Some hospitals may have a small combined unit; others may have separate, sophisticated units for highly specialized treatments. Critical care units shall comply in size, number, and type with these standards and with the operational narrative. The following standards are intended for the more common types of critical care services and shall be appropriate to needs defined in the operational narrative. Where specialized services are required, additions and/or modifications shall be made as necessary for efficient, safe, and effective patient care.

7.3.A. Critical Care (General)

The following shall apply to all types of critical care units, unless otherwise noted. Each unit shall comply with the following provisions.

7.3.A1. The location shall be arranged to eliminate the need for through traffic.

*7.3.A2. In new construction, where elevator transport is required for critically ill patients, the size of the cab and mechanisms and controls shall meet the specialized needs.

*7.3.A3. Each patient space (whether separate rooms, cubicles, or multiple bed space) shall have a minimum of 150 square feet (13.9 square meters) of clear floor area with a minimum headwall width of 12 feet (3.7 meters) per bed, exclusive of anterooms, vestibules, toilet rooms, closets, lockers, wardrobes, and/or alcoves.

7.3.A4. When private rooms or cubicles are provided, view panels to the corridor shall be required and shall have drapes or curtains which may be closed. The door opening to a bed space shall be at least 4 feet (1.22 meters) wide and arranged to minimize interference with movement of beds and large equipment. Sliding doors shall not have floor tracks and shall have hardware that minimizes jamming possibilities.

7.3.A5. Each patient bed area shall have space at each bedside for visitors, and provisions for visual privacy from casual observation by other patients and visitors. For both adult and pediatric units, there shall be a minimum of 8 feet (2.4 meters) between beds.

7.3.A6. Each patient bed shall have visual access, other than skylights, to the outside environment with not less than one outside window in each patient bed area. In renovation projects, clerestory windows with window sills above the heights of adjacent ceilings may be used, provided they afford patients a view of the exterior and are equipped with appropriate forms of glare and sun control. Distance from the patient bed to the outside window shall not exceed 50 feet (15.2 meters). When partitioned cubicles are used, patient's view to outside windows may be through no more than two separate clear vision panels.

7.3.A7. (Not Used)

7.3.A8. (Not Used)

*7.3.A9. Service areas shall be provided within the critical care suite consistent with the requirements of Sections 2.1.H.1., 3, 6, 7, 8, 9, 10, 11, 12 and 16, except that the equipment storage room shall not serve other nursing units or departments.

7.3.A10. Each unit shall contain equipment for continuous monitoring of vital signs, with visual displays for each patient at the bedside and at the nurse station. Monitors shall be located to permit easy viewing and access but not interfere with access to the patient.

*7.3.A11. Each unit shall be designed to provide visual contact between patient beds so that there can be constant visual contact between the nurse and the patient.

7.3.A12. (Not Used)

7.3.A13. (Not Used)

7.3.A14. At least one airborne infection isolation room shall be provided consistent with the requirements of Section 7.2.C., except for a separate bathtub or shower.

7.3.A15. Provisions for X-ray viewing shall be made in the unit.

7.3.A16. Service areas consistent with the requirements of Sections 2.1.H2., 4, 13, and 17, and those areas listed below shall be provided and may be located outside the unit, if conveniently accessible.

a. A visitors' waiting room shall be provided with convenient access to telephones and toilet rooms. One waiting room may serve several critical care units.

b. Adequate office space immediately adjacent to the critical care unit shall be available for critical care medical and nursing management/ administrative personnel. The offices shall be large enough to permit consulting with members of the critical care team and visitors. The offices shall be linked with the unit by telephone or an intercommunications system.

c. Staff lounge(s) shall be located so that staff may be recalled quickly to the patient area in emergencies. The lounge shall have telephone or intercom and emergency code alarm connections to the critical care unit it serves. If not provided elsewhere, provision for the storage of coats, etc., shall be made in this area. One lounge may serve adjacent critical care areas.

d. A special procedures room shall be provided if required by the operational narrative.

e. Sleeping and personal care accommodations for staff on 24-hour on-call work schedules shall be provided.

7.3.B. Coronary Critical Care Unit

Coronary patients have special needs. They are often fully aware of their surroundings, but still need immediate and critical emergency care. In addition to the standards set forth in Section 7.3.A., the following standards apply to the coronary critical care unit.

7.3.B1. Each coronary patient shall have a separate room with acoustical privacy.

7.3.B2. Each coronary patient shall have access to a water closet within the room or in an adjacent toilet room.

7.3.C. Combined Medical/Surgical and Coronary Critical Care

If medical, surgical, and coronary critical care services are combined in one critical care unit, at least 50 percent of the beds shall be located in private rooms or cubicles.

7.3.D. Pediatric Critical Care (Not Used)

7.3.E. Newborn Intensive Care Units

Each Newborn Intensive Care Unit (NICU) shall include or comply with the following.

7.3.E1. The NICU shall have a clearly identified entrance and reception area for families. The area shall permit visual observation and contact with all traffic entering the unit. A scrub area shall be provided at each public entrance to the patient care area(s) of the NICU.

7.3.E2. At least one door to each room in the unit shall be large enough to accommodate portable X-ray equipment.

7.3.E3. (Not Used)

7.3.E4. (Not Used)

7.3.E5. (Not Used)

*7.3.E6. (Not Used)

7.3.E7. A central area shall serve as a control station, shall have space for counters and storage, and shall have convenient access to handwashing facilities. It may be combined with or include centers for reception and communication and patient monitoring.

7.3.E8. Each patient care space shall contain a minimum of 100 square feet (9.29 square meters) excluding sinks and aisles. There shall be an aisle for circulation adjacent to each patient care space with a minimum width of 3 feet (0.91 meter). Each NICU room shall contain no more than 16 infant stations.

7.3.E9. An airborne infection isolation room is required in at least one level of nursery care. The room shall be enclosed and separated from the nursery unit with provisions for observation of the infant from adjacent nurseries or control area(s). All airborne infection isolation rooms shall comply with the requirements of Section 7.2.C., except for separate water closet, bathtub, or shower.

7.3.E10. (Not Used)

7.3.E11. (Not Used)

*7.3.E12. (Not Used)

7.3.E13. (Not Used)

*7.3.E14. A consultation/demonstration/breast feeding or pump room shall be provided convenient to the unit. Provision shall be made for a sink, counter, refrigeration and freezing, storage for pump and attachments, and educational materials.

*7.3.E15. Service areas shall be provided consistent with the requirements of Sections 2.1.H1., 2, 3, 4, 6, 7, 8, 9, 12, 16, 18, 19, and 20.

7.3.E16. (Not Used)

7.3.E17. (Not Used)

7.3.E18. (Not Used)

7.3.E19. Provide a lounge and locker room within or adjacent to the unit suite for staff use.

7.3.E20. (Not Used)

7.3.E21. Housekeeping Room(s)

A housekeeping room(s) shall be provided for the unit. It shall be directly accessible from the unit and be dedicated for the exclusive use of the neonatal critical care unit. It shall contain a service sink or floor receptor and provisions for storage of supplies and housekeeping equipment.

7.3.E22. A visitor's waiting room shall be provided consistent with the requirements of Section 7.3.A16.a.

7.4. Newborn Nurseries

Normal newborn infants shall be housed in nurseries that comply with the standards below. Location shall be within the obstetrical facilities. The nurseries shall be located and arranged to preclude the need for nonrelated pedestrian traffic. No nursery shall open directly into another nursery.

7.4.A. General

Each nursery suite shall contain:

7.4.A1. (Not Used)

7.4.A2. Glazed observation windows to permit the viewing of infants from public areas, workrooms, and adjacent nurseries

7.4.A3. Convenient, accessible storage for linens and infant supplies at each nursery room

7.4.A4. A consultation/demonstration/breast feeding or pump room consistent with the requirements of Section 7.3.E14. and with the operational narrative

7.4.A5. (Not Used)

7.4.A6. An airborne infection isolation room consistent with the requirements of Section 7.3.E9.

7.4.A7. Hospitals having 25 or more postpartum beds shall have a separate nursery that provides continuing care for infants requiring close observation (e.g., those with low birth weight). The minimum floor area per infant shall be 50 square feet (4.65 square meters), exclusive of auxiliary work areas, with provisions for at least 4 feet (1.22 meters) between and at all sides of bassinets. Each nursery room shall contain no more than 16 infant stations.

***7.4.B. Full-Term Nursery**

Each full-term nursery room shall contain no more than 16 infant stations. The minimum floor area shall be 30 square feet (2.79 square meters) for each infant station, exclusive of auxiliary work areas, with provisions for at least 3 feet (91 cm) between and at all sides of bassinets.

The full-term nursery shall have a capacity of 110 percent of the number of licensed postpartum beds. When a rooming-in program is used, the total number of bassinets provided in these units may be appropriately reduced based on adequate justification in the operational narrative, but the full-term nursery may not be omitted in its entirety from any facility that includes delivery services.

7.4.B1. (Not Used)

7.4.C. Charting function consistent with the operational narrative

***7.4.D. Workroom(s)**

Each nursery room shall be served by a connecting workroom. The workroom shall contain a work counter, refrigerator, and storage for supplies. One workroom may serve more than one nursery room provided that required services are convenient to each. The workroom shall be provided with direct access to the corridor without passing through the nursery rooms.

Adequate provision shall be made for storage of emergency cart(s) and equipment out of traffic flow.

7.4.E. Infant Examination and Treatment Room

A separate room shall be provided within the obstetrical service for the examination and treatment of infants. The minimum clear floor area shall be 80 square feet (7.4 square meters). This room shall contain a work counter, storage facilities, and an examination table or counter. This room shall have direct access to a workroom or to a corridor without passing through the nursery rooms.

7.4.F. Soiled Workroom or Soiled Holding Room

A soiled workroom or soiled holding room shall be provided consistent with the requirements of Section 2.1.H7.

7.4.G. Housekeeping Room

A housekeeping room consistent with the requirements of Section 2.1.H17. shall be provided for the exclusive use of the nursery suite.

7.4.H. Provisions for cleaning of bassinets and other equipment shall be made. This function shall be in a separate room on the unit or at a remote location, such as central sterile processing.

***7.5. Pediatric and Adolescent Unit**

The unit shall meet the following standards.

7.5.A. Patient Rooms

Each patient room shall meet the following standards.

7.5.A1. Maximum room capacity shall be consistent with the requirements of Section 7.2.A1.

7.5.A2. The space requirements for pediatric patient rooms shall be consistent with the requirements of Section 7.2.A2.

Additional provisions for hygiene, toilets, sleeping, and personal belongings shall be included where the program indicates that parents will be allowed to remain with young children.

7.5.A3. Each patient room shall have a window consistent with Section 7.28.A10.

7.5.A4. At least one airborne infection isolation room shall be provided consistent with the requirements of Section 7.2.C.

7.5.B. (Not Used)

7.5.C. (Not Used)

7.5.D. (Not Used)

7.5.E. Examination/treatment room(s) consistent with the requirements of Section 2.1.H5. shall be provided.

7.5.F. Service Areas

The service areas in the pediatric and adolescent nursing units shall conform to Section 2.1.H. and shall also meet the following standards.

7.5.F1. Multipurpose or individual room(s) shall be provided within or adjacent to areas serving pediatric and adolescent patrons for dining, education, and developmentally appropriate play and recreation, with access and equipment for patients with physical restrictions. If the operational narrative requires, an individual room shall be provided to allow for confidential parent/family comfort, consultation, and teaching. Insulation, isolation, and structural provisions shall minimize the transmission of impact noise through the floor, walls, or ceiling of these multipurpose room(s).

7.5.F2. (Not Used)

7.5.F3. (Not Used)

7.5.F4. Storage closets or cabinets for toys, educational, and recreational equipment shall be provided.

7.5.F5. Storage space shall be provided to permit exchange of cribs and beds. Provisions shall also be made for storage of equipment and supplies (including cots or recliners, extra linen, etc.) for parents who stay with the patient overnight.

7.5.F6. (Not Used)

7.5.F7. (Not Used)

***7.6. Psychiatric Nursing Unit**

When part of a general hospital, these units shall be designed for the care of ambulatory and nonambulatory inpatients. Provisions shall be made in the design for adapting the area for various types of psychiatric therapies. Details of such facilities should be as described in the operational narrative.

Each nursing unit shall provide the following.

7.6.A. Patient Rooms

The standard noted in Section 7.2.A. shall apply to patient rooms in psychiatric nursing units, except as follows.

7.6.A1. (Not Used)

7.6.A2. (Not Used)

7.6.A3. (Not Used)

7.6.A4. Visual privacy in multibed rooms (e.g., cubicle curtains) is not required.

7.6.B. Service Areas

Service areas for psychiatric nursing units shall be provided consistent with the requirements of Section 2.1.H. with the following additions.

7.6.B1. A secured storage area shall be provided for patients' belongings that are determined to be potentially harmful (e.g., razors, nail files, cigarette lighters).

7.6.B2. (Not Used)

7.6.B3. Food service within the unit shall be one, or a combination, of the following:

a. A nourishment station

b. A kitchenette designed for patient use with staff control of heating and cooking devices

c. A kitchen service within the unit including storage space, refrigerator, and facilities for meal preparation. The kitchen service shall comply with the requirements of Section 7.18.A.

7.6.B4. Storage space for stretchers and wheelchairs shall be provided. This storage may be outside the psychiatric unit, if provisions are made for convenient access as needed for disabled patients.

7.6.B5. A bathtub or shower shall be provided for each six beds or fraction thereof, not otherwise served by bathing facilities within the patient rooms. Bathing facilities shall be designed and located for patient convenience and privacy.

*7.6.B6. A separate charting area shall be provided with provisions for acoustical privacy.

7.6.B7. At least two separate social spaces, one appropriate for noisy activities and one for quiet activities, shall be provided. The combined area shall be at least 40 square feet (3.72 square meters) per patient, with at least 120 square feet (11.15 square meters) for each of the two spaces. This space may be shared by dining activities.

7.6.B8. Space for group therapy shall be provided. This may be combined with the quiet space noted above, provided there is:

a. a minimum of 225 feet (20.9 square meters) of enclosed private space available for group therapy activities, or

b. an addition of 8 square feet of activity space per patient to the activity space required in 7.6.B7. (i.e., 48 square feet per patient.)

7.6.B9. Patient laundry facilities with an automatic washer and dryer shall be provided.

7.6.B10. (Not Used)

7.6.B11. Separate consultation room(s) with a minimum floor space of 100 square feet (9.29 square meters) each, shall be provided at a ratio of one consultation room for each 30 psychiatric beds. The room(s) shall be designed for acoustical and visual privacy, and constructed to achieve a noise reduction of at least 45 decibels.

7.6.B12. Psychiatric units shall provide 15 square feet (1.39 square meters) of separate space per patient for occupational therapy, with a minimum total area of at least 200 square feet (18.58 square meters), whichever is greater. Space shall include provision for handwashing, work counter(s), storage, and displays. Occupational therapy areas may serve more than one nursing unit. When psychiatric nursing unit(s) contain less than 16 beds, the occupational therapy functions may be performed within the noisy activities area, if at least an additional 10 square feet (0.93 square meter) per patient is provided.

7.6.B13. A conference and treatment planning room for use by the psychiatric unit shall be provided.

7.6.C. Airborne Infection Isolation Room(s)

Provisions for airborne infection isolation shall be made in the hospital. The total number of infection isolation rooms shall be determined by an infection control risk assessment. Airborne infection isolation room(s) shall comply with the requirements of Section 7.2.C.

7.6.D. Seclusion Treatment Room

There shall be at least one seclusion room. The seclusion treatment room is intended for short-term occupancy by a violent patient. Within the psychiatric nursing unit, this space provides for patients requiring security and protection. The room(s) shall be located for direct nursing staff supervision. Each room shall be for one patient. It shall have an area of at least 100 square feet and shall be constructed to prevent patient hiding, escape or injury. Seclusion rooms may be grouped together. Special fixtures and hardware for electrical circuits shall be used. Minimum ceiling height shall be 9 feet (2.74 meters). Doors shall be 3 feet 8 inches (1.12 meters) wide, shall open out, and shall permit staff observation of the patient while also maintaining provisions for patient privacy. Seclusion treatment rooms shall be accessed by an anteroom or vestibule which also provides direct access to a toilet room. The toilet room and anteroom shall be large enough to safely manage the patient.

7.7. Surgical Suites

Additions to, and adaptations of, the following elements shall be made for the special-procedure operating rooms found in larger facilities.

The following shall be provided.

7.7.A. Surgery

*7.7.A1. General operating room(s). In new construction, each room shall have a minimum clear area of 400 square feet (37.16 square meters) with a minimum clear dimension of 20 feet (6.10 meters) exclusive of fixed or wall-mounted cabinets and built-in shelves, and a system for emergency communication with the surgical suite control station. X-ray film illuminators for handling at least four films simultaneously shall also be provided.

*7.7.A2. Room(s) for cardiovascular, orthopedic, neurological, and other special procedures that require additional personnel and/or large equipment. This room shall have, in addition to the above, a minimum clear area of 600 square feet (55.74 square meters), with a minimum of 20 feet (6.10 meters) clear dimension exclusive of fixed or wall-mounted cabinets and built-in shelves. When open-heart surgery is performed, an additional room in the restricted area of the surgical suite, adjoining this operating room, shall be designated as a pump room where extracorporeal pump(s), supplies and accessories are stored and serviced. When complex orthopedic and neurosurgical surgery is performed, additional rooms shall be in the restricted area of the surgical suite, preferably adjoining the specialty operating rooms, which shall be designated as equipment storage rooms for the large equipment used to support these procedures. Appropriate plumbing and electrical connections shall be provided in the cardiovascular, orthopedic, neurosurgical, pump, and storage rooms.

7.7.A3. A room for orthopedic surgery. In addition to the requirements of 7.7.A2., this room shall provide enclosed storage space for splints and traction equipment. Storage may be outside the operating room, but shall be conveniently located. If a sink is used for the disposal of plaster of Paris, a plaster trap shall be provided.

*7.7.A4. Room(s) for surgical cystoscopic and other endo-urologic procedures. This room shall have a minimum clear area of 350 square feet (32.52 square meters), with a minimum clear dimension of 15 feet (4.57 meters) exclusive of fixed or wall-mounted cabinets and built-in shelves. X-ray viewing capability to accommodate at least four films simultaneously shall be provided.

7.7.A5. Endoscopy suite requirements (See Section 9.9.)

7.7.A6. (Not Used)

7.7.A7. The surgical suite shall be located and arranged to prevent nonrelated traffic through the suite.

7.7.B. Adjunct Patient Areas

7.7.B1. Preoperative patient holding area(s). In facilities with two or more operating rooms, areas shall be provided to accommodate surgical patients. These areas shall comply with the requirements of 2.1.C.

*7.7.B2. Post-Anesthetic Care Units (PACUs)

Each PACU shall meet the requirements of patient holding areas in 2.1.C. At least one door to the Phase I recovery room shall access directly from the surgical suite without crossing public hospital corridors.

7.7.C. Service Areas

Service areas shall be provided within the surgical suite consistent with the requirements of Section 2.1.H. Additional requirements include:

7.7.C1. (Not Used)

7.7.C2. (Not Used)

7.7.C3. A sterilizing facility(ies) with high-speed sterilizer(s) or other sterilizing equipment for immediate or emergency use shall be grouped to several operating rooms for convenient, efficient use. A work space and handwashing facility shall be included.

7.7.C4. (Not Used)

*7.7.C5. Scrub Facilities

Two scrub positions shall be provided near the entrance to each operating room. Two scrub positions may serve two operating rooms if both are located adjacent to the entrance of each operating room. Scrub facilities shall be arranged to minimize incidental splatter on nearby personnel, medical equipment, or supply carts. The scrub sinks shall be out of the main traffic areas. Scrub sinks shall be located outside the clean core.

7.7.C6. The soiled workroom shall be provided for the exclusive use of the surgical suite.

*7.7.C7. (Not Used)

7.7.C8. Medical gas storage facilities. Main storage of medical gases shall be consistent with NFPA 99. Provision shall be made for additional separate storage of reserve gas cylinders necessary to complete at least one day's procedures.

7.7.C9. An anesthesia workroom for cleaning, testing, and storing anesthesia equipment shall be provided. This room shall contain work counter(s) and sink(s) and racks for medical gas cylinders. Provisions shall be made for separate storage of clean and soiled items. The anesthesia workroom shall provide space for anesthesia case carts and other anesthesia equipment.

7.7.C10. (Not Used)

7.7.C11. Staff clothing change areas. Appropriate areas shall be provided for male and female personnel (orderlies, technicians, nurses, and doctors) working within the surgical suite. The areas shall contain lockers, showers, water closets, handwashing facilities, and space for donning surgical attire. These areas shall be arranged to provide a one-way traffic pattern so that personnel entering from outside the surgical suite can change and move directly into the surgical suite.

7.7.C12. Staff lounge and toilet facilities. Separate or combined lounges for male and female staff shall be provided. Lounge(s) shall be designed to minimize the need to leave the suite and to provide convenient access to the recovery room.

7.7.C13. (Not Used)

7.7.C14. Outpatient Recovery

If the operational narrative includes outpatient surgery, provisions shall be made for separating outpatients into two categories, (Phase I) patients receiving general anesthesia and (Phase II) patients not subjected to general anesthesia. This requirement shall be satisfied by separate rooms. Recovery spaces shall meet the requirements of Section 2.1.C.

7.7.C15. Change areas for outpatients and same-day admissions.

If the operational narrative defines outpatient surgery as part of the surgical suite, a separate area shall be provided where outpatients may change from street clothing into hospital gowns and be prepared for surgery. This would include a waiting room, locker(s), water closet(s), and clothing change or gowning area. Changing may also be accommodated in a private holding room or cubicle.

7.7.C16. Provisions shall be made for patient examination, interviews, preparation, testing, and obtaining vital signs of patients for outpatient surgery.

7.7.C17. (Not Used)

7.7.C18. Storage areas for portable X-ray equipment, stretchers, fracture tables, warming devices, auxiliary lamps, etc., shall be provided. These areas shall be out of corridors and traffic.

7.7.C19. A housekeeping room shall be provided for the exclusive use of the surgical suite.

7.7.C20. An area for preparation and examination of frozen sections shall be provided consistent with the operational narrative. It shall be located in an enclosed room which is accessible both from the restricted corridor of the surgical suite and from a general corridor of the facility.

7.7.C21. (Not Used)

7.7.C22. Refrigerated blood bank storage shall be provided.

7.7.C23. Refrigeration facilities for harvested organs shall be provided consistent with the operational narrative.

7.7.C24. Space for pathological specimens storage prior to transfer to pathology section shall be provided.

7.7.C25. See Section 9.5. of this document concerning the separate outpatient surgical unit.

7.7.C26. Provide space for convenient access to and use of emergency crash carts at both the surgical and recovery areas.

*7.8. Obstetrical Facilities

7.8.A. Obstetrical Suite

7.8.A1. General

The obstetrical unit shall be located and designed to prohibit non-related traffic through the unit. When delivery and operating rooms are in adjacent areas, access and service arrangements shall be such that neither staff nor patients need to travel through one area to reach the other. Except as permitted otherwise herein, existing facilities being renovated shall, as far as practicable, provide all the required support services.

*7.8.A2. Postpartum Unit

a. Postpartum bedrooms shall meet the requirements for patient rooms in Section 7.2.A.

(1) Where rooming in is described in the operational narrative, an additional 30 square feet (2.79 square meters) of clear area per bassinet shall be provided with a minimum of 3 feet (91 cm) of clearance between walls and the sides and foot of the bassinet and between the bed and the bassinet.

(2) (Not Used)

(3) (Not Used)

(4) (Not Used)

(5) (Not Used)

(6) (Not Used)

b. Service areas for this unit shall be provided consistent with the requirements of Section 2.1.H. Additionional requirements include:

(1) Staff lounge facilities shall be provided.

(2) The soiled workroom shall be provided for the exclusive use of the obstetrical suite.

(3) When bathing facilities are not provided in patient rooms, there shall be at least one shower and/or bathtub for each 6 beds or fraction thereof, consistent with the requirements of Section 2.1.H14.

(4) A housekeeping room shall be provided for the exclusive use of the postpartum unit.

(5) Nurseries shall be provided consistent with Section 7.4.

c. Airborne Infection Isolation Room(s)

Provisions for airborne infection isolation shall be made in the hospital. The total number of infection isolation rooms shall be determined by an infection control risk assessment. Airborne infection isolation room(s) shall comply with the requirements of Section 7.2.C.

7.8.A3. Caesarean/Delivery Suite

a. Caesarean/delivery room(s) shall have a minimum clear floor area of 360 square feet (33.45 square meters) with a minimum dimension of 16 feet (4.88 meters) exclusive of built-in shelves or cabinets. There shall be a minimum of one such room in every obstetrical service.

b. (Not Used)

c. Infant resuscitation space shall be provided within the caesarean/delivery room(s) or may be provided in a separate, but immediately accessible room.

d. Labor Room(s) (LDR rooms may be substituted.)

Where LDRs or LDRPs are not provided, a minimum of two labor beds shall be provided for each caesarean/delivery room. In facilities that have only one caesarean/delivery room, two labor rooms shall be provided. Each room shall be designed for either one or two beds with a minimum clear area of 120 square feet (11.15 square meters) per bed. Each labor room shall contain a handwashing facility and have access to a toilet room. One toilet room may serve two labor rooms. Labor rooms shall have controlled access with doors that are arranged for observation from a nursing station. At least one shower (which may be separate from the labor room if under staff control) for use of patients in labor shall be provided. Windows in labor rooms, if provided, shall be located, draped, or otherwise arranged, to preserve patient privacy from casual observation from outside the labor room.

e. Recovery Room(s) (LDR/LDRPs may be substituted.)

Recovery areas (shall comply with the requirements of Section 2.1.C.) and may be omitted in hospitals with fewer than 1500 births per year.

Each recovery room shall contain at least two beds and have a nurse station with charting facilities located to permit visual control of all beds. There shall be enough space for baby and crib, and a chair for the support person.

f. Service areas shall be provided, consistent with the requirements of Section 2.1.H. Additional requirements include:

(1) An enclosed soiled workroom (or soiled holding room that is part of a system for the collection and disposal of soiled material) for the exclusive use of the caesarean/delivery suite shall be provided.

(2) A waiting room, with toilet rooms, telephones, and drinking fountains conveniently located.

(3) A sterilizing facility(ies) with high-speed sterilizer(s) or other sterilizing equipment for immediate or emergency use shall be grouped to several caesarean/delivery rooms for convenient, efficient use consistent with the operational narrative. A work space and handwashing facility shall be included.

(4) Scrub facilities. Two scrub positions shall be provided near the entrance to each caesarean/delivery room(s). Two scrub positions may serve two caesarean/delivery rooms, if both are located adjacent to the entrance of each caesarean/delivery room. Scrub facilities shall be arranged to minimize incidental splatter on nearby personnel, medical equipment, or supply carts. The scrub sinks shall be out of the main traffic areas. Scrub sinks shall be located outside the clean core.

(5) Medical gas storage facilities. Main storage of medical gases may be outside or inside the facility, consistent with NFPA 99. Provision shall be made for additional separate storage of reserve gas cylinders necessary to complete at least one day's procedures.

(6) An anesthesia workroom for cleaning, testing, and storing anesthesia equipment shall be provided. This room shall contain work counter(s) and sink(s) and racks for medical gas cylinders. Provisions shall be made for separate storage of clean and soiled items. The anesthesia workroom shall provide space for anesthesia case carts and other anesthesia equipment.

(7) Staff clothing change areas. Appropriate areas shall be provided for male and female personnel (orderlies, technicians, nurses, and doctors) working within the obstetrical suite. The areas shall contain lockers, showers, water closets, handwashing facilities, and space for donning surgical attire. These areas shall be arranged to provide a one-way traffic pattern so that personnel entering from outside the obstetrical suite can change and move directly into the obstetrical suite.

(8) Male and female support persons change area (designed as described above).

(9) Staff lounge and toilet facilities. Separate or combined lounges for male and female staff shall be provided. Lounge(s) shall be designed to minimize the need to leave the obstetrical suite and to provide convenient access to the recovery room.

(10) An on-call room(s) for physician and/or staff may be located elsewhere in the facility.

(11) A housekeeping room shall be provided for the exclusive use of the delivery suite.

(12) Storage areas for portable X-ray equipment, stretchers, warming devices, auxiliary lamps, etc. These areas shall be out of corridors and traffic.

*7.8.A4. LDR and LDRP Facilities

a. When provided by the operational narrative, delivery procedures in accordance with birthing concepts may be performed in the LDR or LDRP rooms. LDR room(s) may be located in a separate LDR suite or as part of the caesarean/delivery suite. The postpartum unit may contain LDRP rooms. These rooms shall have a minimum of 250 square feet (23.23 square meters) of clear floor area with a minimum dimension of 13 feet (3.96 meters), exclusive of toilet room, closet, alcove, or vestibules. There shall be enough space for crib and reclining chair for support person. An area within the room, but distinct from the mother's area, shall be provided for infant stabilization and resuscitation. Medical gas outlets shall be located in the room so that they are accessible to the mother's delivery area and infant resuscitation area.

b. Each LDR or LDRP room shall be for single occupancy and have direct access to a private toilet with shower or tub. Each room shall be equipped with handwashing facilities.

c. Each LDRP shall have a window consistent with Section 7.28.A10.

d. Service areas for this unit shall be provided consistent with the requirements of Sections 7.8.A2.b. and 7.8.A3.f.

7.9. Emergency Service

*7.9.A. Definition

Levels of emergency care range from initial emergency management to definitive emergency care. For classification of emergency departments/services/trauma centers, see Appendix A.

*7.9.A1. (Not Used)

*7.9.A2. (Not Used)

*7.9.B. General (Not Used)

7.9.C. Initial Emergency Management

At a minimum, each hospital shall have provisions for emergency treatment for staff, employees, and visitors, as well as for persons who may be unaware of or unable to immediately reach services in other facilities. This is not only for patients with minor illnesses or injuries that may require minimal care, but also for persons with severe illness and injuries who must receive immediate emergency care and assistance prior to transport to other facilities.

Provisions for initial emergency management shall include:

7.9.C1. A well-marked, illuminated, and covered entrance, at grade level

Reception, triage, and control station shall be located to permit staff observation and control of access to treatment area, pedestrian and ambulance entrances, and public waiting area.

Exception: Specialty Hospitals which do not provide emergency services shall indicate by signage that NO EMERGENCY SERVICE is available.

7.9.C2. Examination/treatment rooms consistent with the requirements of Section 2.1.H5., except that the room may have additional space and provisions for several patients with cubicle curtains for privacy. Multiple-bed treatment rooms shall provide a minimum of 80 square feet (7.43 square meters) per patient cubicle.

7.9.C3. Storage out of traffic and under staff control for general medical/surgical emergency supplies, medications, and equipment such as ventilator, defibrillator, splints, etc.

7.9.C4. Provisions for reception, control, and public waiting, including a public toilet room with handwashing facility(ies), and telephone

7.9.C5. Patient toilet rooms shall be provided at a ratio of one for every eight treatment stations or fraction thereof.

7.9.C6. (Not Used)

*7.9.C7. Airborne Infection Control

7.9.C8. The unit shall be served by support spaces as defined by the operational narrative. As a minimum, these spaces shall include those defined by Sections 2.1.H1., 3, 6, 7, 17, and 21.

7.9.D. Definitive Emergency Care

The type, size, and number of the services shall be as defined in the operational narrative. As a minimum, the following shall be provided.

7.9.D1. A grade-level well-marked, illuminated, and covered entrance. There shall be direct access to this entrance from public roads for ambulance and vehicle traffic. The entrance and driveway shall be clearly marked. If a raised platform is used for ambulance discharge, provide a ramp for pedestrian and wheelchair access.

7.9.D2. Paved emergency access to permit discharge of patients from automobiles and ambulances, and parking convenient to the entrance

7.9.D3. Reception, triage and control station shall be located to permit staff in at least one of these areas to observe and control access to the treatment area, pedestrian and ambulance entrances, and the public waiting area

As the point of entry and assessment for patients with undiagnosed and untreated airborne infections, the triage area shall be designed and ventilated to reduce exposure of staff, patients and families to airborne infectious diseases. If determined by the infection control risk assessment, one or more separate, enclosed spaces designed and ventilated as airborne infection isolation rooms shall be required.

7.9.D4. Wheelchair and stretcher storage shall be provided for patients. This shall be out of traffic with convenient access from emergency entrances.

*7.9.D5. Public waiting area, toilet facilities, drinking fountains, and telephones shall be provided. If so determined by the hospital infection control risk assessment, the emergency department waiting area shall require special measures to reduce the risk of airborne infection transmission.

7.9.D6. Communication center shall be convenient to nursing station and have radio, telephone, and intercommunication systems.

*7.9.D7. Examination and treatment room(s) shall be designed consistent with the requirements of Section 2.1.H5., except that the room may have additional space and provisions for several patients with cubicle curtains for privacy. Multiple-bed treatment rooms shall provide a minimum of 80 square feet (7.43 square meters) per patient cubicle.

*7.9.D8. Trauma/cardiac rooms for emergency procedures, including emergency surgery, shall have at least 250 square feet (23.23 square meters) of clear floor space. Each room shall have an examination light, X-ray film illuminators, work counter, medical equipment, cabinets, storage for patient care supplies, and counter space for writing. Additional space with cubicle curtains for privacy shall be provided to accommodate more than one patient at a time in the trauma room. Provisions shall be made for monitoring the patient. There shall be storage provided for immediate access to attire used for universal precautions. Doorways leading from the ambulance entrance to the cardiac trauma room shall be a minimum of 5 feet (1.52 meters) wide to simultaneously accommodate stretchers, equipment, and personnel.

7.9.D9. Provisions for orthopedic and cast work may be in separate room(s) or in the trauma room. They shall include storage for splints and other orthopedic supplies, traction hooks, X-ray film illuminators, work counters and examination lights. If a sink is used for the disposal of plaster of Paris, a plaster trap shall be provided. The room(s) shall be designed consistent with the requirements of Section 2.1.H5., except that the room may have additional space and provisions for several patients with cubicle curtains for privacy. Multiple-bed treatment rooms shall provide a minimum of 80 square feet (7.43 square meters) per patient cubicle.

7.9.D10. Scrub stations shall be located adjacent to each trauma room.

7.9.D11. (Not Used)

7.9.D12. (Not Used)

7.9.D13. (Not Used)

7.9.D14. Emergency Equipment Storage

Sufficient space shall be provided for emergency equipment that is under direct control of the nursing staff, such as a CPR cart, pumps, ventilators, patient monitoring equipment, and portable X-ray unit. This room shall be located in an area easily accessible to staff but out of normal traffic patterns.

7.9.D15. Toilet rooms for patients shall be provided at the ratio of one for every eight treatment stations or fraction thereof.

*7.9.D16. Service areas shall be provided consistent with the requirements of Sections 2.1.H., 1, 2, 3, 6, 7, 17, and 21.

7.9.D17. (Not Used)

7.9.D18. (Not Used)

7.9.D19. (Not Used)

7.9.D20. (Not Used)

*7.9.D21. Security

A security system shall be provided consistent with the operational narrative.

7.9.D22. Airborne Infection Isolation Room. At least one airborne infection isolation room shall be provided consistent with Section 7.2.C., except that bathing facilities are not required. The need for additional airborne infection isolation rooms shall be determined by the infection control risk assessment.

*7.9.D23. Bereavement Room

7.9.D24. Secured Holding Room

At least one holding/seclusion room of 120 square feet (11.15 square meters) shall be provided. This room shall allow for security, patient and staff safety, patient observation, and soundproofing.

7.9.D25. (Not Used)

***7.9.E. Other Space Considerations**

7.10. Diagnostic and Therapeutic Radiology

(Angiography, MRI, Cardiac Cath Lab, Nuclear Medicine, Radiotherapy, PET, etc.)

7.10.A. General

*7.10.A1. Diagnostic and Therapeutic radiology rooms shall be sized in compliance with manufacturers' recommendations. The rooms shall be sized to provide a minimum 3'-0" (0.91 meter) clearance for access to the patient on 3 sides of the table. The door swing shall not encroach on the equipment or patient circulation space.

7.10.A2. Angiography rooms, cardiac catheterization labs and similar procedure rooms shall have a minimum of 400 square feet (37.16 square meters) of usable floor space exclusive of cabinetry, with clearance of at least 3'0" (0.91 meter) around the procedure table. The door swing shall not encroach on the equipment or patient circulation space.

7.10.A3. The location of controls for equipment shall provide for a full view of the patient by staff.

7.10.A4. For angiography and cardiac catheterization labs and similar procedure rooms, a scrub sink shall be provided in a space on the outside of the staff entry door to the room. In addition, a handwashing facility shall be provided within the procedure room.

*7.10.A5. An environmentally controlled equipment room(s) or enclosure(s) shall be provided which is large enough to contain X-ray transformers, power modules, and associated electronics, and electrical equipment for angiography, cardiac catheterization, C.T. Scanner and similar procedure rooms.

7.10.B. Support Spaces and Services

7.10.B1. A control/reception space shall be provided.

7.10.B2. Waiting/Holding Area

a. Patient and public waiting areas shall be provided. If waiting space serves both inpatients and outpatients, the area shall be designed to assure visual privacy for patients.

b. A holding area for patients on stretchers or beds shall be provided out of traffic and under control of staff. The holding area shall comply with the requirements of 2.1.C.

7.10.B3. Toilet rooms with handwashing facilities shall be provided convenient to the patient waiting rooms and shall be equipped with emergency call systems. Separate toilet rooms shall be provided with direct access from each ultrasound and fluoroscopic room.

7.10.B4. Patient dressing rooms shall provide a seat or bench, mirror, and provisions for storing patient clothing and for securing valuables.

7.10.B5. Staff Facilities

a. Toilet rooms and locker rooms shall be provided to accommodate staff working on the service(s).

b. Space shall be provided for staff gowning.

7.10.B6. A film storage space for storage of active patient films or records shall be provided for imaging services within the suite.

7.10.B7. Secure space shall be provided for inactive film and medical record storage.

7.10.B8. Storage space shall be provided for unexposed film.

7.10.B9. Provisions shall be made for film processing. Film processing equipment shall be in close proximity to procedure rooms. View boxes for evaluating film following processing shall be located in close proximity to film processing equipment. If automatic film processors are used, a sink of adequate size shall be provided to clean the processor racks.

7.10.B10. Offices for physicians and administrative staff shall be provided for viewing, consultations, and charting.

7.10.B11. Specialty Support Rooms or Spaces

a. Contrast media preparation rooms shall include a sink, counter and storage for media and supplies.

b. A dosimetry equipment area shall be provided for radiotherapy suite.

c. A room shall be provided for radiopharmaceutical preparation and/or storage of pre-prepared materials.

d. A dose administration area shall be provided for Positron Emission Tomography (PET). It shall be located near the preparation area.

e. A hypothermia room shall be provided for the radiotherapy suite.

f. A mold room shall be provided for the radiotherapy suite. Space shall be provided for the storage of blocks used in radiotherapy treatments.

g. Exam rooms shall be provided in the radiotherapy suite consistent with the operational narrative. Each exam room shall be consistent with Section 2.1.H5.

h. The patient preparation and post-procedure observation area provided for invasive procedures shall meet the requirements of Section 2.1.C.

7.10.B12. Service areas consistent with Sections 2.1.H6., 7, 8 and 17 shall be provided.

7.10.B13. (Not Used)

7.10.B14. (Not Used)

*7.10.B15. Space shall be provided for Magnetic Resonance Imaging services for the storage of cryogenic gases.

7.10.C. (Not Used)

7.10.D. **(Not Used)**

7.10.E. **(Not Used)**

***7.11.** **Reserved**

***7.12.** **Laboratory**

The following physical facilities shall be provided within the hospital as defined in the operational narrative.

7.12.A. Laboratory work counter(s) with space for microscopes, chemical analyzer(s), incubator(s), centrifuge(s), etc., shall be provided. Work areas shall include sinks with water and access to vacuum, gases, air, and electrical services as needed.

7.12.B. Refrigerated blood storage facilities for transfusions shall be provided. Blood storage refrigerators shall be equipped with temperature-monitoring and alarm signals.

7.12.C. Lavatory(ies) or counter sink(s) equipped for handwashing shall be provided.

***7.12.D.** Storage facilities, including refrigeration, for reagents, flammable liquids, standards, supplies, stained specimen microscope slides, etc., shall be provided.

7.12.E. Specimen (blood, urine, and feces) collection facilities shall be provided separate from the laboratory workspace.

1. The blood collection area shall have a work counter, space for patient seating, and handwashing facilities.

2. The urine and feces collection room shall be equipped with water closet and lavatory. This facility may be located outside the laboratory suite.

3. Make provisions for the collection of sputum for patients suspected of having infectious Mycobacterium tuberculosis consistent with Section 7.15.E., if indicated by the Infection Control Risk Assessment.

7.12.F. Chemical safety provisions, including emergency shower and eyeflushing devices, shall be provided in the work areas.

***7.12.G.** **(Not Used)**

***7.12.H.** **(Not Used)**

7.12.I. Administrative areas, including offices and space for clerical work, filing, reception, and record maintenance, shall be provided.

7.12.J. Lounge, locker, and toilet facilities shall be conveniently located for male and female laboratory staff. These may be outside the laboratory area and shared with other departments.

7.12.K. Patient waiting facility shall be conveniently located. It may be outside the laboratory area and shared with other departments.

7.13. Rehabilitation Therapy

7.13.A. General

Rehabilitation therapy is primarily for restoration of body functions and may contain one or several categories of services. If a formal rehabilitative therapy service is included in a project, the facilities and equipment shall be consistent with the operational narrative. Where two or more rehabilitative services are included, items may be shared, as appropriate.

7.13.B. Common Elements

Each rehabilitative therapy department shall include service areas consistent with the requirements of Sections 2.1.H3., 12, 13, 15, and 17, in addition to the following, which may be shared or provided as separate units for each service.

7.13.B1. Office and clerical space with provision for filing and retrieval of patient records.

7.13.B2. Reception and control station(s) with visual control of waiting and activities areas. (This may be combined with office and clerical space.)

7.13.B3. Patient waiting area(s) out of traffic with provision for wheelchairs.

7.13.B4. (Not Used)

7.13.B5. (Not Used)

7.13.B6. (Not Used)

7.13.B7. (Not Used)

7.13.B8. Convenient access to toilets and lockers

7.13.B9. Access to a demonstration/conference room

7.13.C. Physical Therapy

If physical therapy is part of the service, the following, at least, shall be included:

7.13.C1. Individual treatment area(s) with privacy screens or curtains. Each such space requiring a table or stretcher shall have not less than 70 square feet (6.51 square meters) of clear floor area.

7.13.C2. (Not Used)

7.13.C3. Exercise Area and Facilities

7.13.C4. Clean Linen and Towel Storage

7.13.C5. (Not Used)

7.13.C6. Separate storage for soiled linen, towels, and supplies

7.13.C7. If required by the operational narrative, patient dressing areas, showers, and lockers shall be provided.

7.13.C8. Thermotherapy, diathermy, ultrasonics, and hydrotherapy shall be provided when required by the operational narrative.

***7.13.D. Occupational Therapy**

If this service is provided, the following, at least, shall be included.

7.13.D1. Work areas and counters suitable for wheelchair access

7.13.D2. (Not Used)

7.13.D3. (Not Used)

7.13.D4. (Not Used)

7.13.E. Prosthetics and Orthotics

If this service is provided, the following, at least, shall be included.

7.13.E1. Workspace for technicians

7.13.E2. Space for evaluating and fitting, with provision for privacy

7.13.E3. (Not Used)

7.13.E4. Space for prosthetics/orthotics lab environmentally controlled for the fabrication/ modification of devices

7.13.F. Speech and Hearing

If this service is provided, the following, at least, shall be included.

7.13.F1. Space for evaluation and treatment

7.13.F2. (Not Used)

***7.14. Renal Dialysis Unit** (Acute and Chronic)

7.14.A. General

Acute care dialysis may occur at patient bedside in critical care units and elsewhere. In these cases, dedicated utilities (water and waste drain) shall be provided. Where the hospital determines that a dedicated unit is desirable for acute dialysis, the requirements of Section 7.14. shall apply. For chronic outpatient ESRD treatment, the requirements of Section 7.14. shall apply.

7.14.A1. (Not Used)

*7.14.A2. (Not Used)

*7.14.A3. (Not Used)

7.14.B. Treatment Area

7.14.B1. The treatment area shall be separate from administrative and waiting areas.

7.14.B2. Nurse's station(s) shall be located within the dialysis treatment area and designed to provide visual observation of all patient stations.

7.14.B3. Individual patient treatment areas shall contain at least 80 square feet (7.44 square meters) for chairs and 100 square feet (9.3 square meters) for beds/stretchers. There shall be at least a 4-foot (1.22 meters) space between beds, stretchers and/or lounge chairs, with a minimum of 4 feet (1.2 meters) at the foot of each bed, stretcher, or lounge chair.

7.14.B4. (Not Used)

7.14.B5. The unit shall be designed to provide privacy for each patient.

7.14.B6. The number of and need for required airborne infection isolation rooms shall be determined by an infection control risk assessment. When required, the airborne infection isolation room(s) shall be consistent with the requirements of Section 7.2.C., except that toilet rooms and bathing facilities are not required.

7.14.B7. Service areas shall be provided consistent with the requirements of 2.1.H6., 7, 8, 9, 10, 13, 17, and 21.

7.14.B8. If home training is provided in the unit, a private treatment area of at least 120 square feet (11.15 square meters) shall be provided for patients who are being trained to use dialysis equipment at home. This room shall contain a counter and a separate drain for fluid disposal.

7.14.B9. Examination/treatment room(s) shall have a minimum clear floor area of 120 square feet (11.2 square meters). They may be combined with the home training room.

7.14.B10. (Not Used)

7.14.B11. (Not Used)

7.14.B12. If dialyzers are reused, a reprocessing room is required. It shall be sized to perform the functions required. The reprocessing room shall be designed to provide work flow from soiled to clean.

7.14.B13. (Not Used)

7.14.B14. The housekeeping room shall be for the exclusive use of the unit.

7.14.B15. If required by the operational narrative, an equipment repair and breakdown room shall be provided. It shall be equipped with a deep service sink, work counter and storage cabinet.

7.14.B16. (Not Used)

7.14.B17. (Not Used)

7.14.B18. (Not Used)

7.14.B19. (Not Used)

7.14.B20. The water treatment equipment shall be located in an enclosed room.

7.14.B21. (Not Used)

7.14.C. Ancillary Facilities

7.14.C1. Staff clothing change areas. Appropriate areas shall be provided for male and female personnel (orderlies, technicians, nurses, and doctors) working within the unit. The areas shall contain lockers, showers, water closets, handwashing facilities, and space for donning scrub attire.

7.14.C2. Storage for patients' belongings shall be provided.

7.14.C3. A waiting room, toilet room, drinking fountain, public telephone, and seating accommodations shall be available or accessible to the dialysis unit.

7.14.C4. Office and clinical work space shall be available for administrative services.

7.15. Respiratory Therapy Service

If respiratory therapy service is provided, the following elements shall be included as a minimum.

7.15.A. Service areas consistent with the requirements of Sections 2.1.H2., 3, 12, and 15.

***7.15.B. Space for Cleaning and Disinfecting Equipment**

Space for storage of clean equipment and supplies shall be functionally separate from the space for receiving and cleaning of soiled equipment.

7.15.C. Ancillary Facilities

7.15.C1. Office and clerical space with provision for filing and retrieval of patient records

7.15.C2. (Not Used)

7.15.C3. (Not Used)

7.15.C4. Access to a demonstration/conference room

7.15.D. If respiratory services such as testing and demonstration for outpatients are part of the program, provisions shall be made for:

7.15.D1. Patient waiting area with provision for wheelchairs

7.15.D2. A reception and control station

7.15.D3. (Not Used)

7.15.D4. (Not Used)

7.15.E. Facilities for Cough-Inducing and Aerosol-Generating Procedures

All cough-inducing procedures performed on patients who may have infectious Mycobacterium tuberculosis shall be performed in booths or special enclosures with discharge HEPA filters or exhaust directly to the outside. These procedures may also be performed in a room that meets the ventilation requirements for airborne infection Isolation. See Table 2A for ventilation requirements.

7.16. Morgue

7.16.A. The following elements shall be provided when autopsies are performed in the hospital.

7.16.A1. Refrigerated facilities for body holding

*7.16.A2. An autopsy room containing the following:

a. A work counter with a deep sink and grinder for tissue disposal

b. A storage space for supplies, equipment, and specimens

c. An autopsy table

7.16.A3. A housekeeping room shall be provided convenient to the area.

7.16.A4. A clothing change area with shower, water closet, and lockers

7.16.B. If autopsies are performed outside the facility, a temperature-controlled body-holding room shall be provided.

***7.16.C.** Provisions shall be made for body viewing and identification.

7.17. Pharmacy

*7.17.A. General

The size and type of services to be provided in the pharmacy will depend upon the type of drug distribution system used, number of patients to be served, and extent of shared or purchased services. This shall be described in the operational narrative. The pharmacy room or suite shall be located for convenient access, staff control, and security. Facilities and equipment shall be as necessary to accommodate the functions of the narrative. (Satellite facilities, if provided, shall include those items required by the narrative.) As a minimum, the following elements shall be included.

7.17.B. Dispensing

7.17.B1. A pickup and receiving area

7.17.B2. Work counters and space for automated and manual dispensing activities

7.17.B3. An area for temporary storage, exchange, and restocking of carts

7.17.B4. Security provisions for drugs and personnel in the dispensing counter area

7.17.C. Manufacturing

7.17.C1. A bulk compounding area

7.17.C2. Provisions for packaging and labeling

7.17.C3. A quality-control area

7.17.D. Storage (may be cabinets, shelves, and/or separate rooms or closets)

7.17.D1. Bulk Storage

7.17.D2. Active Storage

7.17.D3. Refrigerated Storage

7.17.D4. (Not Used)

7.17.D5. Secure storage for narcotics and controlled drugs

7.17.D6. Storage for general supplies, records and equipment not in use

7.17.E. Administration

7.17.E1. Provision for cross-checking of medication and drug profiles of individual patients

7.17.E2. Poison control, reaction data, and drug information centers

7.17.E3. A separate room or area for office function including desk, filing, communication, and reference

7.17.E4. Provisions for patient counseling and instruction (may be in a room separate from the pharmacy)

7.17.E5. A room for education and training (may be in a multipurpose room shared with other departments)

7.17.F. Other

7.17.F1. (Not Used)

7.17.F2. Provide for convenient access to toilet room and locker

7.17.F3. If unit dose procedure is used, provide space and equipment for supplies, packaging, labeling, and storage, as well as a space for the carts.

7.17.F4. If solutions are prepared in the pharmacy, provide a clean work area with a laminar-flow work station designed for product protection. The laminar-flow system shall include a nonhydroscopic filter rated at 99.97 percent (HEPA), as tested by DOP tests, and have a visible pressure gauge for detection of filter leaks or defects. Cytotoxic chemotherapy agents are to be prepared in a Class II: Type B2 (as defined by the National Sanitation Foundation) biological safety cabinet with 100 percent of the air exhausted to the roof. A Class II: Type B2 hood provides: (1) a minimum velocity of 100 fpm at the access opening, (2) HEPA filtered downflow air drawn from the pharmacy/outside, (3) exhaust all air through a HEPA filter to the outside, and (4) ducts/plenums are maintained under a negative pressure.

7.17.F5. (Not Used)

***7.18. Dietary Facilities**

7.18.A. General

Food service facilities and equipment shall comply with the Food Service Sanitation Regulations of the State of Michigan, which consist of:

1. the Public Health Code, Act 368, P.A. of 1978, Part 129, as amended
2. the 1976 edition of the USPHS Model Food Service Sanitation Ordinance, and
3. Food Service Sanitation Rules promulgated under the authority of Section 12909 of the Public Health Code

7.19. Administration and Public Areas

The following shall be provided:

7.19.A. (Not Used)

7.19.B. Lobby

This shall include:

7.19.B1. A counter or desk for reception and information

7.19.B2. Public waiting area(s)

7.19.B3. Public toilet facilities

7.19.B4. Public telephones

7.19.B5. Drinking fountain(s)

7.19.B6. Storage space for wheelchairs

7.19.C. (Not Used)

7.19.D. Admissions Area

If required by the operational narrative for initial admission of inpatients, the area shall include:

7.19.D1. A separate waiting area for patients and accompanying persons

7.19.D2. A work counter or desk for staff

7.19.D3. A storage area for wheelchairs, out of the path of normal traffic

7.19.E. (Not Used)

7.19.F. (Not Used)

7.19.G. (Not Used)

7.20. Medical Records

The following shall be provided:

7.20.A. Medical Records Administrator/Technician Office

7.20.B. Review and Dictation Area

7.20.C. Sorting, Recording, or Microfilming Records Area

7.20.D. Record Storage Area with security provisions to assure confidentiality of medical records

7.20.E. Area for Public Access for Review of Medical Records

7.21. Central Services

The following shall be provided:

7.21.A. **The Soiled Workroom** shall be functionally separated from all other areas of the department. Workspace shall be provided to handle the cleaning and decontamination of all medical/surgical instruments and equipment.

***7.21.B.** **The Clean Assembly/Workroom** shall contain workspace and equipment for terminal sterilizing of medical and surgical equipment and supplies.

7.21.C. An area for breakdown and storage for clean and sterile supplies shall be provided.

7.21.D. **Staff Clothing Change Areas.** Appropriate areas shall be provided for male and female staff working within the suite. The areas shall contain lockers, water closets, handwashing facilities, and space for donning work attire.

7.22. General Stores

The following shall be provided:

7.22.A. Off-Street Unloading Facilities

7.22.B. Receiving Area

7.22.C. **General storage room(s)** with a total area of not less than 20 square feet (1.86 square meters) per inpatient bed shall be provided. Storage may be in separate, concentrated areas within the institution or in one or more individual buildings on-site.

7.22.D. (Not Used)

7.23. Linen Services

7.23.A. General

Each facility shall have provisions for storing and processing of clean and soiled linen. Processing may be done within the facility, in a separate building on- or off-site, or in a commercial or shared laundry.

7.23.B. Each facility shall provide the following elements:

7.23.B1. A separate room for holding of soiled linen

7.23.B2. A central clean linen receiving/storage room

7.23.C. If linen is processed in a laundry facility located in the hospital or hospital campus, the following shall be provided:

7.23.C1. A separate laundry processing area, with commercial equipment, sized to process at least a seven day supply within the regular scheduled work week

7.23.C2. The laundry and equipment shall be arranged to minimize cross-contamination of clean linen and maintain an orderly work flow.

7.23.C3. An area shall be provided for the sorting, folding and mending of clean linen.

7.23.C4. An area shall be provided for storage of extra stock linens.

7.24. Cart Cleaning Facilities

Facilities shall be provided to clean and sanitize carts serving the central service department, dietary facilities, and linen services. These facilities may be centralized or departmentalized.

7.25. Staff Facilities

Lockers, lounges, and toilet rooms shall be provided for employees and volunteers.

7.26. Housekeeping Rooms

In addition to the housekeeping rooms required in certain departments, sufficient housekeeping rooms consistent with the requirements of Section 2.1.H17. shall be provided throughout the facility as required to maintain a clean and sanitary environment. There shall not be less than one housekeeping room for each floor.

7.27. Engineering Service and Equipment Areas

Sufficient space shall be included in all mechanical and electrical equipment rooms for proper maintenance of equipment. Provisions shall also be made for removal and replacement of equipment. The following elements shall be provided.

7.27.A. (Not Used)

7.27.B. Engineer's office with file space and provisions for protected storage of facility drawings, records, manuals, etc.

7.27.C. General maintenance shop(s) for repair and maintenance of equipment

***7.27.D.** Storage rooms separate from mechanical and electrical equipment rooms for building maintenance supplies

7.27.E. Separate area or room specifically for storage, repair, and testing of electronic and other medical equipment. The amount of space and type of utilities will vary with the type of equipment involved and types of outside contracts used.

7.27.F. (Not Used)

7.28. General Standards for Details and Finishes

7.28.A. Details

7.28.A1. (Not Used)

7.28.A2. (Not Used)

7.28.A3. Location of items such as drinking fountains, telephones, vending machines, and portable equipment shall not restrict corridor traffic or reduce the corridor width below the minimum standard.

7.28.A4. Rooms which contain bathtubs, sitz baths, showers, and/or water closets for patient use shall be equipped with doors and hardware permitting emergency access from the outside. When such rooms have only one opening or are small, the doors shall open outward or in a manner that will avoid pressing a patient who may have collapsed within the room.

7.28.A5. (Not Used)

7.28.A6. All door openings to rooms needing access for beds or stretchers shall provide a minimum clear opening of 41.5 inches (1.05 meters). Door openings to patient toilet rooms and other rooms needing access for wheelchairs shall provide a minimum clear opening of 32 inches (0.81 meter).

7.28.A7. (Not Used)

7.28.A8. Doors, except those to spaces such as small closets not subject to occupancy, shall not swing into corridors in a manner that might obstruct traffic flow at any point in its swing or reduce the required corridor width.

7.28.A9. Windows and outer doors that frequently may be left open shall be equipped with insect screens.

7.28.A10. Patient rooms or suites in new construction intended for 24-hour occupancy shall have windows. Each required window shall have a bottom of glass elevation not higher than 3’-0” (91 cm) above finished floor and shall be above grade. In rooms requiring windows, the clear glass area of the windows shall be a minimum of 10 percent of the required floor area of the room. A clear unobstructed viewing distance of 20 feet (6.10 meters) plus one foot (0.3 meter) for each 2 foot (0.6 meter) rise above the first story up to a maximum of 40 feet (12.2 meters) shall be provided in line with the head of the patient(s) beds. Windows within a normal sight line that would permit observation into a room shall be arranged or draped to provide for patient privacy.

7.28.A11. Windows shall be designed to prevent accidental falls when open, or shall be provided with security screens where deemed necessary by the operational narrative.

7.28.A12. (Not Used)

7.28.A13. Thresholds and expansion joint covers shall be flush with the floor surface to facilitate the use of wheelchairs and carts.

7.28.A14. Grab bars shall be provided at each patient water closet, shower, bathtub, and sitz bath at a wall clearance of 1-1/2 inches (3.81 cm). Bars, including those which are part of fixtures such as soap dishes, shall be sufficiently anchored to sustain a concentrated load of 250 pounds (113.4 kilograms).

7.28.A15. (Not Used)

7.28.A16. Mirrors shall not be installed at handwashing fixtures in food preparation areas, nurseries, clean and sterile supply areas, scrub sinks, or other areas where asepsis control would be lessened by hair combing.

7.28.A17. (Not Used)

7.28.A18. (Not Used)

7.28.A19. (Not Used)

*7.28.A20. The minimum ceiling height shall be 7 feet 10 inches (2.39 meters), with the following exceptions:

a. Ceilings in storage rooms and toilet rooms shall be not less than 7 feet 6 inches (2.34 meters) in height. Ceiling heights in small, normally unoccupied spaces may be reduced.

b. Suspended tracks, rails, and pipes located in the traffic path for patients in beds and/or on stretchers, including those in inpatient service areas, shall be not less than 7 feet (2.13 meters) above the floor. Clearances in other areas may be 6 feet 8 inches (2.03 meters).

7.28.A21. (Not Used)

7.28.A22. Rooms containing heat-producing equipment, such as boiler or heater rooms or laundries, shall be insulated and ventilated to prevent the floor surface above and/or the adjacent walls of occupied areas from exceeding a temperature of 10°F (6 °C) above ambient room temperature.

7.28.A23. The noise reduction criteria shown in Table 1 shall apply to partitions, floors, and ceiling construction in patient areas.

7.28.A24. Eyewash facilities and/or emergency showers meeting the design specifications of the American National Standards Institute ANSI Z358.1-1990 shall be provided in all areas where materials which are corrosive, caustic, or otherwise injurious are handled.

7.28.A25. Any fixed horizontal surface more than 68 inches (1.73 meters) above the floor shall be enclosed by a soffit or bulkhead to the ceiling above, or provided with a sloped top (minimum 1 to 3 vertical to horizontal) in all patient, clinical and food preparation areas.

7.28.A26. Furniture and equipment which are not easily moved by housekeeping personnel, and where sufficient access is not provided to permit cleaning under and behind the unit, shall be sealed against the floors and adjoining walls. These items include, but are not limited to, file cabinets, work counters, wardrobes, desks, ventilating hoods in laboratories and pharmacies, and storage cabinets.

*7.28.A27. Equipment such as refrigerators, medicine and clean supplies dispensing units, kitchen equipment and similar types of furnishings shall be installed so that it can be routinely moved for cleaning.

7.28.A28. Equipment typically found in various imaging special procedure, nuclear medicine, and cardiac catheterization suites, including but not limited to electrical cabinets, floor mounted tables and gantries, exposed cabling and trays, conduits, and transformers shall comply with 7.28.A25. to 7.28.A27. or be located outside the patient treatment rooms in separate mechanical or electrical rooms.

7.28.A29. Light fixtures (including indirect and recessed light fixtures) in patient areas shall be equipped with lens covers for safety and to facilitate cleaning.

7.28.B. Finishes

7.28.B1. (Not Used)

7.28.B2. (Not Used)

7.28.B3. (Not Used)

*7.28.B4. Floor materials shall be easily cleanable and appropriately wear-resistant for the location. Floors in areas used for food preparation or food assembly shall be water-resistant. Floor surfaces, including tile joints, shall be resistant to food acids. In all areas subject to frequent wet-cleaning methods, floor materials shall not be physically affected by germicidal cleaning solutions. Floors subject to traffic while wet (such as shower and bath areas, kitchens, and similar work areas) shall have a nonslip surface. The floors and perimeter bases of kitchens, soiled workrooms, and other areas subject to frequent wet cleaning shall also be homogeneous, but may have tightly sealed joints.

7.28.B5. In new construction or major renovation work, the floors and perimeter bases of all operating rooms and any delivery rooms used for caesarean sections shall be monolithic and joint free.

7.28.B6. Wall finishes shall be washable. In the vicinity of plumbing fixtures, wall finishes shall be smooth and water-resistant.

Wall construction, finish, and trim, including the joints between the walls and the floors, shall be free of insect- and rodent-harboring spaces.

In operating rooms, delivery rooms for caesarean sections, isolation rooms, and sterile processing rooms, wall finishes shall be smooth and free of fissures, open joints, or crevices that may retain or permit passage of dirt particles.

7.28.B7. Floors and walls penetrated by pipes, ducts, and conduits shall be tightly sealed to minimize entry of rodents and insects. Joints of structural elements shall be similarly sealed.

7.28.B8. Ceilings, including exposed structure, shall be cleanable with routine housekeeping equipment.

In operating rooms, delivery rooms for caesarean sections, isolation rooms, and sterile processing rooms, provide ceilings that are smooth and free of fissures, open joints, or crevices and minimize retention or passage of dirt particles. In psychiatric patient rooms, toilets, and seclusion rooms, ceiling construction shall be monolithic to inhibit possible escape or suicide. Ceiling-mounted air and lighting devices shall be security type. Ceiling-mounted fire prevention sprinkler heads shall be of the concealed type.

7.28.B9. (Not Used)

***7.29. Design and Construction, Including Fire-Resistant Standards (Not Used)**

7.30. Special Systems

7.30.A. (Not Used)

7.30.B. Elevators

All hospitals having patient facilities (such as bedrooms, dining rooms, or recreation areas) or critical services (such as operating, delivery, diagnostic, or therapeutic) located on other than the grade-level entrance floor shall have electric or hydraulic elevators.

7.30.B1. In the absence of an engineered traffic study, the following guidelines for number of elevators shall apply:

a. At least two elevators shall be installed when 1 to 200 patient beds are located on floors other than the main entrance floor, or where the major inpatient services are located on a floor other than those containing patient beds.

b. For hospitals with more than 200 beds, the number of elevators shall be determined from a study of the hospital plan and the expected vertical transportation requirements.

*7.30.B2. Elevator cars shall have inside dimensions that accommodate a patient bed with attendants and be at least 5 feet 8 inches (1.73 meters) wide by 9 feet (2.74 meters) deep. Car doors shall have a clear opening of not less than 4 feet (1.22 meters) wide and 7 feet (2.13 meters) high. In renovations, existing elevators that can accommodate patient beds used in the facility will not be required to be increased in size.

Note: Additional elevators installed for visitors and material handling may be smaller than noted above, within restrictions set by standards for disabled access.

7.30.B3. Elevators shall be equipped with a two-way automatic level-maintaining device with an accuracy of ± 1/4 inch (± 0.64 cm).

7.30.B4. Each elevator, except those for material handling, shall be equipped with an independent keyed switch for staff use for bypassing all landing button calls and responding to car button calls only.

*7.30.B5. Elevator call buttons and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch, shall be used in combination with door-edge safety devices and shall be interconnected with a system of smoke detectors.

7.30.B6. Field inspections and tests shall be made and the owner shall be furnished with written certification stating that the installation meets the requirements set forth in this section, as well as all applicable safety regulations and codes.

7.30.C. Waste Processing Services

7.30.C1. Storage and Disposal

Facilities shall be provided for sanitary storage and treatment or disposal of waste using techniques acceptable to the appropriate health and environmental authorities. The operational narrative shall stipulate the categories and volumes of waste for disposal and shall stipulate the methods of disposal for each.

*7.30.C2. Medical Waste

Medical waste shall be disposed of either by incineration or other approved technologies. Incinerators or other major disposal equipment may be shared by two or more institutions.

a. Incinerators or other major disposal equipment may also be used to dispose of other medical waste where local regulations permit. Equipment shall be designed for the actual quantity and type of waste to be destroyed and shall meet all applicable regulations.

b. Incinerators with fifty-pounds-per-hour or greater capacities shall be in a separate room or outdoors; those with lesser capacities may be located in a separate area within the facility boiler room. Rooms and areas containing incinerators shall have adequate space and facilities for incinerator charging and cleaning, as well as necessary clearances for work and maintenance. Provisions shall be made for operation, temporary storage, and disposal of materials so that odors and fumes do not drift back into occupied areas. Existing approved incinerator installations, which are not in separate rooms or outdoors, may remain unchanged provided they meet the above criteria.

c. The design and construction of incinerators and trash chutes shall comply with NFPA 82.

*d. Heat recovery

*e. Environmental guidelines

7.30.C3. Nuclear Waste Disposal. See Code of Federal Regulations, Title X, Parts 20 and 35, concerning the handling and disposal of nuclear materials in health care facilities.

7.31. Mechanical Standards

7.31.A. General

*7.31.A1. The HVAC systems shall be designed to achieve and meet occupancy comfort conditions in accordance with Tables 2A and 2B and filtration efficiencies in accordance with Table 3.

*7.31.A2. Existing HVAC equipment serving remodeled areas shall meet Table 2A and 2B standards and Table 3 filtration efficiencies. The existing supply, return, and exhaust duct systems serving the remodeled areas shall be cleaned inside and properly sealed.

*7.31.A3. (Not Used)

*7.31.A4. (Not Used)

*7.31.A5. (Not Used)

*7.31.A6. (Not Used)

*7.31.A7. Vibration isolators shall be used for HVAC equipment, duct work, and piping to isolate vibration and noise from transmitting to the facility's structure.

7.31.A8. (Not Used)

7.31.B. Thermal and Acoustical Insulation

7.31.B1. Insulation for HVAC systems shall be provided for piping, equipment, and duct work to conserve energy, protect personnel, prevent condensation, and reduce noise.

7.31.B2. Insulation on cold surfaces shall include an exterior vapor barrier. Material that will not absorb or transmit moisture will not require a separate vapor barrier.

*7.31.B3. (Not Used)

*7.31.B4. Where existing lined exhaust and return air ductwork is reworked in a renovation project, the liner seams and punctures shall be resealed or replaced. If duct lining is used, it shall be coated and sealed, and shall meet ASTM C1071. Existing lined supply air ducts serving remodeled areas shall be replaced with new unlined supply air ducts.

7.31.B5. Duct linings exposed to air movement shall not be used in new supply ducts. This requirement shall not apply to mixing boxes and acoustical traps that have special coverings over such lining.

7.31.C. Steam and Hot Water Systems

*7.31.C1. Boilers shall have the capacity, based upon the net ratings published by the Hydronics Institute or another acceptable national standard, to supply the normal heating, hot water, and steam requirements of all systems and equipment. Their number and arrangement shall accommodate facility needs, despite the breakdown or routine maintenance of any one boiler.

7.31.C2. Boiler accessories including feed pumps, heat-circulating pumps, condensate return pumps, fuel oil pumps, and waste heat boilers shall be connected and installed to provide both normal and standby service.

7.31.C3. Supply and return mains and risers shall be equipped with valves at each branch from the main. Each piece of equipment shall have valves at the supply and return ends.

7.31.D. Air Conditioning, Heating, and Ventilation Systems

*7.31.D1. The ventilation system for the space shall be adequate to maintain the space condition based on space load requirements but be no less than the requirements of Tables 2A and 2B. Table 3 filtration efficiencies shall also be used. Airflow shall be controlled and maintained to ensure movement of air from “clean” to “less clean” areas.

All rooms used for patient care shall be temperature controlled and shall comply with the standards set in Table 2B.

*7.31.D2. Exhaust systems serving patient care areas shall be fully ducted with the exhaust fan located at the discharge end of the system, and shall be located to provide serviceability.

*7.31.D3. Outdoor air intakes shall be located at least 25 feet (7.62 meters) from exhaust outlets of ventilating systems, combustion equipment stacks, medical-surgical vacuum systems, plumbing vents, or areas that may collect vehicular exhaust or other noxious fumes. Plumbing vents that terminate at a level above the top of the air intake may be located as close as 10 feet (3.05 meters). The bottom of outdoor air intakes serving central systems shall be as high as practical, but at least 6 feet (1.83 meters) above ground level, or, if installed above the roof, 3 feet (91 cm) above roof level. Exhaust outlets from areas that may be contaminated shall be above roof level and arranged to minimize recirculation of exhaust air into the building.

7.31.D4. In new construction and major renovation work, air supply for operating and delivery rooms and major invasive procedure rooms, such as cardiac catheterization labs and angiography rooms, shall be from ceiling diffusers near the center of the work area. Return and exhaust grilles shall be near the floor level. Each operating and delivery room shall have at least two return or exhaust grilles located as remotely from each other as practical.

*7.31.D5. (Not Used)

*7.31.D6. Each space routinely used for administering inhalation anesthesia and inhalation analgesia shall be served by a scavenging system to vent waste gases. If a vacuum system is used, the gas-collecting system shall be arranged so that it does not disturb patients' respiratory systems. Gases from the scavenging system shall be exhausted directly to the outside.

7.31.D7. The bottoms of ventilation (supply/return) openings shall be at least 6 inches (15.2 cm) above the floor.

7.31.D8. All central ventilation or air conditioning systems shall be equipped with filters with efficiencies equal to, or greater than, those specified in Table 3. Where two filter beds are required, filter bed no. 1 shall be located upstream of the air conditioning equipment and filter bed no. 2 shall be downstream of any fan or blowers. Filter efficiencies shall be tested consistent with ASHRAE 52.1-92. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing duct work. All joints between filter segments and enclosing duct work shall have gaskets or seals to provide a positive seal against air leakage. A manometer or other means to monitor pressure differential shall be installed across each filter bed having a required efficiency of 75 percent or more including hoods requiring HEPA filters meeting the hot DOP test.

*7.31.D9. If duct humidifiers are located upstream of the final filters, they shall be located at least 15 feet (4.57 meters) upstream of the final filters. Ductwork with duct-mounted humidifiers shall have a means of water removal. An adjustable high-limit humidistat shall be located downstream of the humidifier to reduce the potential for condensation inside the duct. All duct takeoffs shall be sufficiently downstream of the humidifier to ensure complete moisture absorption. Steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.

7.31.D10. Air-handling duct systems shall be designed with accessibility for duct cleaning and shall meet the requirements of NFPA 90A.

*7.31.D11. (Not Used)

7.31.D12. (Not Used)

7.31.D13. Hoods and safety cabinets shall not be used as the sole means for normal exhaust of a space. If air change standards in Table 2A do not provide sufficient air for proper operation of exhaust hoods and safety cabinets (when in use), supplementary makeup air (filtered and preheated) shall be provided around these units to maintain the required airflow direction and exhaust velocity. Use of make-up air will avoid dependence upon infiltration from outdoor and/or from contaminated areas. Make-up air systems for hoods shall be arranged to minimize "short circuiting" of air and to avoid reduction in air velocity at the point of contaminant capture.

*7.31.D14. Laboratory hoods shall meet the following general standards:

a. Provide an average face velocity of 100 fpm (feet per minute) (0.51 meter/second) with no point less than 85 fpm (0.43 meter/second).

b. Be connected to an exhaust system to the outside which is separate from the building exhaust system. No recirculation or transfer of lab air to other spaces is allowed.

c. Have an exhaust fan located at the discharge end of the system, with the exhaust duct under negative pressure. Keep discharge duct, located inside building, as short as possible and sealed leak free. Arrange outdoor air discharge to minimize re-entrainment of exhaust air.

d. Have an exhaust duct system of noncombustible corrosion-resistant material, as needed to meet the planned usage of the hood.

e. New facilities and remodeled facilities shall conform to American National Standard for Laboratory Ventilation, ANSI/AIHA Z9.5, latest issue. (AIHA - American Industrial Hygiene Association).

f. New laboratory fume hoods must be certified to have passed the ASHRAE 110 test, latest issue.

*7.31.D15. Laboratory hoods shall meet the following special standards:

a. Fume hoods and their associated equipment in the air stream intended for use with perchloric acid and other strong oxidants, shall be constructed of stainless steel or other material consistent with special exposures and shall be provided with a water wash and drain system to permit periodic flushing of duct and hood consistent with NFPA 45. When perchloric acid or other strong oxidants are only transferred from one container to another, standard laboratory fume hoods and the associated equipment may be used in lieu of stainless steel construction.

b. In new construction and major renovation work, each hood used to process infectious or radioactive materials shall have a minimum average face velocity of 100 fpm (0.51 meter/second) with no point under 85 fpm (0.43 meter/second). Use suitable pressure-independent air volume control devices to maintain a constant air volume. Provide each hood with a face velocity monitoring and low airflow alarm system to alert staff of fan shutdown or loss of airflow. The monitoring device shall include an airflow volume readout, normal and unsafe lights, and an alarm horn with silencer. Each shall also have filters with a 99.97 percent efficiency (based on the dioctyl-phthalate (DOP) test method) in the exhaust stream, and be designed and equipped to permit the safe removal, disposal, and replacement of contaminated filters. The HEPA filter system shall include arrangement and devices to allow in-place DOP test certification. Filters shall be as close to the hood as practical to minimize duct contamination.

c. Fume hoods intended for use with radioactive isotopes shall be constructed of stainless steel or other material suitable for the particular exposure and shall comply with NFPA 801, Facilities for Handling Radioactive Materials.

Note: Radioactive isotopes used for injections, etc., without probability of airborne particulates or gases, may be processed in a clean-workbench-type hood where acceptable to the Nuclear Regulatory Commission.

7.31.D16. Exhaust hoods in food preparation centers shall comply with the requirements of the Description of Ventilation Systems - Food Service Establishments pursuant to Rule R325.26001 of the Michigan Administrative Code.

7.31.D17. The ventilation system for anesthesia storage rooms shall conform to the requirements of NFPA 99, including the gravity option. Mechanically-operated air systems are optional in this room.

7.31.D18. The ventilation system for the space that houses ethylene oxide (ETO) sterilizers shall be designed to:

a. Provide a dedicated (not connected to a return air or other exhaust system) exhaust system. Refer to Title 29 Code of Federal Regulations Part 1910.1047.

b. All source areas shall be exhausted, including the sterilizer equipment room, service/aeration areas, over the sterilizer door, and the aerator. If the ETO cylinders are not located in a well-ventilated, unoccupied equipment space, an exhaust hood shall be provided over the cylinders. The relief valve shall be terminated in a well-ventilated, unoccupied equipment space, or outside the building. If the floor drain which the sterilizer(s) discharges to is not located in a well-ventilated, unoccupied equipment space, an exhaust drain cap shall be provided (coordinate with local codes).

c. Ensure that general airflow is away from sterilizer operator(s).

d. An audible and visual alarm shall activate in the sterilizer work area, and a 24-hour staffed location, upon loss of airflow in the exhaust system.

7.31.D19. (Not Used)

7.31.D20. Rooms with fuel-fired equipment shall be provided with sufficient outdoor air to maintain equipment combustion rates and to limit work station temperatures.

7.31.D21. (Not Used)

7.31.D22. (Not Used)

7.31.D23. Special consideration shall be given to the type of heating and cooling units, ventilation outlets, and appurtenances installed in patient seclusion and psychiatric rooms. The following shall apply:

a. All air grilles and diffusers shall be of a type that prohibits the insertion of foreign objects. All exposed fasteners shall be tamper-resistant.

b. All convector or HVAC enclosures exposed in the room shall be constructed with rounded corners and shall have enclosures fastened with tamper-resistant screws.

c. HVAC equipment shall be of a type that minimizes the need for maintenance within the room.

*7.31.D24. All cough-inducing procedures performed on patients who may have infectious Mycobacterium tuberculosis shall be performed in booths or special enclosures with discharge HEPA filters or exhaust directly to the outside. These procedures may also be performed in a room that meets the ventilation requirements for airborne infection control. See Table 2A for ventilation requirements.

7.31.D25. Individual room units that are used for heating and cooling purposes (fan-coil units, heat pump units, etc.) shall be equipped with cleanable or replaceable filters. The filters shall have a minimum efficiency of 25 percent based on ASHRAE 52.1-92 atmospheric dust spot efficiency. These units may be used as recirculating units only. All outdoor air requirements shall be met by a separate central air handling system with the proper filtration, as noted in Table 3.

7.31.E. Plumbing and Other Piping Systems

Unless otherwise specified herein, all plumbing systems shall be designed and installed in accordance with the authority having jurisdiction.

7.31.E1. The following standards shall apply to plumbing fixtures:

a. The material used for plumbing fixtures shall be nonabsorptive and acid-resistant.

b. Water spigots used in lavatories and sinks shall have clearances adequate to avoid contaminating utensils and the contents of carafes, etc., consistent with the requirements of Section 2.1.A.

c. (Not Used)

d. Clinical sinks shall have an integral trap wherein the upper portion of the water trap provides a visible seal.

e. Showers and tubs shall have nonslip walking surfaces.

7.31.E2. The following standards shall apply to potable water supply systems:

a. (Not Used)

b. Each water service main, branch main, and riser shall have valves. Stop valves shall be provided for each fixture. Access shall be provided at all valves.

c. Backflow prevention devices shall be installed on hose bibbs, supply nozzles used for connection of hoses or tubing, and at other locations where the potable water supply must be protected from contamination.

d. Bedpan-flushing devices (may be cold water) shall be provided in each inpatient toilet room; however, installation is optional in psychiatric and alcohol-abuse units where patients are ambulatory.

e. Potable water storage vessels (hot and cold) not intended for constant use shall not be installed.

7.31.E3. The following standards shall apply to hot water systems:

a. The water-heating system shall have sufficient supply capacity at the temperatures and amounts indicated in Table 4. Water temperature is measured at the point of use or inlet to the equipment.

b. Hot-water distribution systems serving patient care areas shall be under constant recirculation to provide continuous hot water at each hot water outlet. The temperature of hot water for bathing fixtures and handwash lavatories shall be appropriate for comfortable use but shall not exceed 120^0F (49 ^{o}C) (see Table 4).

7.31.E4. The following standards shall apply to drainage systems:

a. Drain lines from sinks used for acid waste disposal shall be made of acid-resistant material.

b. Drain lines serving some types of automatic blood-cell counters shall be of carefully selected material that will eliminate potential for undesirable chemical reactions (and/or explosions) between sodium azide wastes and copper, lead, brass, and solder, etc.

*c. (Not Used)

d. Floor drains shall not be installed in operating and delivery rooms.

*e. If a floor drain is installed in cystoscopy, it shall contain a nonsplash, horizontal-flow flushing bowl beneath the drain plate.

f. Drain systems for autopsy tables shall be designed to positively avoid splatter or overflow onto floors or back siphonage and for easy cleaning and trap flushing.

g. Building sewers shall discharge into community sewerage. Where such a system is not available, the facility shall treat its sewage in accordance with local and state regulations. (See Section 3.1.D.)

h. Kitchen grease traps shall be located and arranged to permit easy access without the need to enter food preparation or storage areas. Grease traps shall be of capacity required and shall be accessible from outside of the building without need to interrupt any services.

i. Where plaster traps are used, provisions shall be made for appropriate access and cleaning.

j. In dietary areas, floor drains and/or floor sinks shall be of type that can be easily cleaned by removal of cover. Provide floor drains or floor sinks at all "wet" equipment (such as ice machines) and as required for wet cleaning of floors. Location of floor drains and floor sinks shall be coordinated to avoid conditions where locations of equipment make removal of covers for cleaning difficult.

7.31.E5. The installation, testing, and certification of nonflammable medical gas and air systems shall comply with the requirements of NFPA 99.
(See Table 5 for rooms requiring station outlets.)

7.31.E6. Clinical vacuum system installations shall be consistent with NFPA 99.
(See Table 5 for rooms which require station outlets.)

7.31.E7. All piping, except control-line tubing, shall be identified. All service main, branch main, and riser valves shall be tagged, and a valve schedule shall be provided to the facility owner for permanent record and reference.

7.31.E8. (Not Used)

7.31.E9. Provide condensate drains for cooling coils of type that may be cleaned as needed without disassembly. (Unless specifically required by local authorities, traps are not required for condensate drains.) Provide air gap where condensate drains empty into floor drains. Provide heater elements for condensate lines in freezer or other areas where freezing may be a problem.

7.32. Electrical Standards

7.32.A. General

7.32.A1. All electrical material and equipment, including conductors, controls, and signaling devices, shall be installed consistent with applicable sections of NFPA 70 and NFPA 99 and shall be listed as complying with available standards of listing agencies, or other similar established standards where such standards are required.

*7.32.A2. All required alarms shall sound at a location which is staffed 24-hours per day.

*7.32.A3. (Not Used)

7.32.B. Services, Switchboards, Panelboards and Transformers

Main switchboards, panelboards and transformers shall be located in an area separate from plumbing and mechanical equipment and shall be accessible to authorized persons only.

Switchboards, panelboards and transformers shall be convenient for use, readily accessible for maintenance, away from traffic lanes, and located in dry, ventilated spaces free of corrosive or explosive fumes, gases, or any flammable material. Overload protective devices shall operate properly in ambient room temperatures.

Panelboards serving normal lighting and appliance circuits shall be located on the same floor as the circuits they serve. Panelboards serving critical branch emergency circuits shall be located on each floor that has major users (operating rooms, delivery suites, intensive care, etc.). Panelboards serving Life Safety circuits may also serve floors above and/or below.

7.32.C. Panelboards (Not Used)

7.32.D. Lighting

7.32.D1. Lighting shall meet or exceed the minimum illumination levels listed in Table 12.

7.32.D2. (Not Used)

7.32.D3. Patient rooms and adjacent toilet rooms shall have general lighting and night lighting. A reading light shall be provided for each patient. Reading light controls shall be readily accessible to the patient(s). Incandescent and halogen light sources which produce heat shall be avoided to prevent burns to the patient and/or bed linen. Flexible light arms, if used, shall be mechanically controlled to prevent the lamp from contacting the bed linen. At least one night light fixture in each patient room shall be controlled at the room entrance. Lighting for coronary and intensive care bed areas shall permit staff observation of the patient while minimizing glare.

7.32.D4. Operating and delivery rooms, LDR's and LDRP's shall have general lighting in addition to special lighting units provided at surgical and obstetrical tables or beds. General lighting and special lighting shall be on separate circuits.

7.32.D5. Nursing unit corridors shall have general illumination with provisions for reducing light levels at night.

*7.32.D6. (Not Used)

*7.32.D7. (Not Used)

7.32.D8. A portable or fixed examination light shall be provided for examination, treatment, and trauma rooms.

7.32.D9. (Not Used)

7.32.D10. Light fixtures shall be equipped with lenses or shields for protection of the lamps or with lamps which will not shatter.

7.32.E. Receptacles

*7.32.E1. Each operating and delivery room shall contain, at a minimum, sixteen single or eight duplex outlet receptacles at the head of the table and eight single, four duplex or combination thereof, receptacles throughout the rest of the room. Where mobile X-ray, laser, or other equipment with special electrical plug configurations is used, additional receptacles distinctively marked for X-ray or laser use shall be provided. The receptacles shall have the standardized NEMA configuration, as determined by the operating and/or delivery room staff. Combinations of these configurations shall be permitted where more

than one standard configuration is used. The circuiting of these receptacles shall comply with the National Electrical Code with respect to connections to the Normal and Essential Electrical Systems.

*7.32.E2. Each patient room shall have duplex receptacles. There shall be one at each side of the head of each bed, one for the television, if used, and one on each other wall. Receptacles may be omitted from exterior walls where construction or room configuration makes installation impractical. Nurseries shall have at least two duplex receptacles for each bassinet. Critical care areas as defined by NFPA 99 and NFPA 70, including pediatric and newborn intensive care units, shall have at least seven duplex outlets at the head of each bed, crib, or bassinet. Trauma and resuscitation rooms shall have eight duplex outlets located convenient to the head of each bed. Emergency department examination and treatment rooms shall have a minimum of six duplex outlets located convenient to the head of each bed. At least 50 percent of critical care and emergency care outlets shall be connected to emergency system power and be so labeled. Each general care examination and treatment table and each work table shall have access to two duplex receptacles.

7.32.E3. Duplex receptacles for general use shall be installed approximately 50 feet (15.24 meters) apart in all corridors and within 25 feet (7.62 meters) of corridor ends. Receptacles in pediatric and psychiatric unit corridors shall be of the tamper resistant type. Special receptacles marked for X-ray use shall be installed in corridors of patient areas so that mobile equipment may be used anywhere within a patient room using a cord length of 50 feet (15.24 meters) or less. If the same mobile X-ray unit is used in operating rooms and in nursing areas, receptacles for X-ray use shall permit the use of one plug in all locations. Where capacitive discharge or battery-powered X-ray units are used, special X-ray receptacles are not required.

7.32.E4. Electrical receptacles supplied from the emergency systems shall be distinctively colored or marked for identification. If color is used for identification purposes, the same color shall be used throughout the facility.

7.32.E5. (Not Used)

7.32.F. Equipment

7.32.F1. (Not Used)

7.32.F2. (Not Used)

7.32.F3. X-ray film illuminators for displaying at least four films simultaneously in each operating room and at least two films simultaneously in specified emergency treatment rooms, and the X-ray viewing room of the radiology department shall be installed. All illuminator units within one space or room shall have lighting of uniform intensity and color value.

7.32.F4. (Not Used)

7.32.F5. (Not Used)

*7.32.F6. (Not Used)

*7.32.F7. (Not Used)

7.32.G. Nurses Calling System

7.32.G1. In patient areas, each patient room shall be served by at least one calling station for two-way voice communication. Each bed shall be provided with a call device. Two call devices serving adjacent beds may be served by one calling station. Calls shall activate a visible signal in the corridor at the patient's door, in the clean work room, in the soiled work room, medication, charting, clean linen storage, nourishment, equipment storage, and examination/treatment room(s) and at the nursing station of the nursing unit. In multi-corridor nursing units, additional visible signals shall be installed at corridor intersections. In rooms containing two or more calling stations, indicating lights shall be provided at each station. Nurses calling systems at each calling station shall be equipped with an indicating light which remains lighted as long as the voice circuit is operating.

7.32.G2. A nurses emergency call station shall be provided at each patient water closet, bathtub, sitz bath, and shower stall. A nurses emergency call shall be accessible to a collapsed patient lying on the floor. Inclusion of a pull cord will satisfy this standard.

The emergency call shall be designed so that a signal activated at a patient's calling station will initiate a visible and audible signal distinct from the regular nurse calling system that can be turned off only at the patient calling station. The signal shall activate an annunciator panel at the nurse station, a visible signal in the corridor at the patient's door, and at other areas defined by the operational narrative. Provisions for emergency calls will also be needed in outpatient and treatment areas where patients may be subject to incapacitation.

7.32.G3. In areas such as critical care, recovery and pre-op, the bedside nurses call station shall activate a signal readily seen at the control station.

7.32.G4. An emergency assistance system for staff to summon additional assistance shall be provided in each operating, delivery, recovery, emergency examination and/or treatment area, and in critical care units, nurseries, special procedure rooms, cardiac catheterization rooms, stress-test areas, triage, out-patient surgery, admission and discharge areas, diagnostic/treatment areas, and areas for psychiatric patients, including seclusion rooms, anterooms and toilet rooms serving them, communal toilet and bathing facility rooms, dining, activity, therapy, exam, and treatment rooms. This system shall annunciate visually and audibly in the clean work room, in the soiled work room, medication, charting, clean linen storage, nourishment, equipment storage, and examination/treatment room(s), if provided, and at the nursing station of the nursing unit with back-up to another staffed area from which assistance can be summoned.

7.32.G5. In critical care units, recovery and pre-op, the call system shall include provisions for an emergency code resuscitation alarm to summon assistance from outside the unit.

7.32.G6. A nurse call is not required in psychiatric nursing units, but if it is included, provisions shall be made for easy removal, or for covering call button outlets. In psychiatric nursing units all nurse call hardware shall have tamper-resistant fasteners.

7.32.G7. (Not Used)

7.32.G8. (Not Used)

*7.32.G9. (Not Used)

***7.32.H. Emergency Electric Service**

Emergency power shall be provided consistent with NFPA 99, NFPA 101, and NFPA 110.

***7.32.I.** (Not Used)

7.32.J. Telecommunications and Information Systems

7.32.J1. Locations for terminating telecommunications and information system devices shall be provided.

7.32.J2. A room shall be provided for central equipment locations. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

Table 1
Sound Transmission Limitations in General Hospitals and Outpatient Facilities

	Airborne sound transmission class (STC)[a]	
	Partitions	Floors
New construction		
Patient room to patient room	45	40
Public space to patient room[b]	55	40
Service areas to patient room[c]	65	45
Patient room access corridor[d]	45	45
Existing construction		
Patient room to patient room	35	40
Public space to patient room[b]	40	40
Service areas to patient room[c]	45	45

[a] Sound transmission class (STC) shall be determined by tests consistent with methods set forth in ASTM E90 and ASTM E413. Where partitions do not extend to the structure above, sound transmission through ceilings and composite STC performance must be considered.

[b] Public space includes corridors (except patient room access corridors), lobbies, dining rooms, recreation rooms, treatment rooms, and similar space.

[c] Service areas include kitchens, elevators, elevator machine rooms, laundries, garages, maintenance rooms, boiler and mechanical equipment rooms, and similar spaces of high noise. Mechanical equipment located on the same floor or above patient rooms, offices, nurses stations, and similar occupied space shall be effectively isolated from the floor.

[d] Patient room access corridors contain composite walls with doors/windows and have direct access to patient rooms.

Table 2A
Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]
SURGERY AND CRITICAL CARE					
Operating/surgical cystoscopic rooms[9]	Out	3	15	--	No
Delivery room[9]	Out	3	15	--	No
Recovery room[9]	--	2	6	--	No
Critical and intensive care	Out	2	6	--	No
Treatment room [10]	--	--	6	--	--
Trauma room[10]	Out	3	15	--	No
Anesthesia gas storage	In	--	8	Yes	--
Endoscopy	In	2	6	--	No
Bronchoscopy	In	2	12	Yes	No
NURSING					
Patient room	--	2	2	--	--
Toilet room	In	--	10	Yes	--
Newborn nursery	Out	2	6	--	No

Table 2A (Continued)
Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]
Protective environment room[11]	Out	2	12	--	No
Airborne infection isolation room[12]	In	2	12	Yes	No
Isolation alcove or anteroom[11,12]	In/Out	--	10	Yes	No
Labor/delivery/recovery	--	2	2	--	--
Labor/delivery/recovery/postpartum	--	2	2	--	--
Patient corridor	--	--	2	--	--
ANCILLARY					
Radiology					
X-ray (surgical/critical care and catheterization)	Out	3	15	--	No
X-ray (diagnostic & treatment)	--	--	6	--	--
Darkroom	In	--	10	Yes	No
Laboratory					
General[13]	--	2	6	--	--
Biochemistry[13]	Out	2	6	--	No
Cytology	In	2	6	Yes	No

Table 2A (Continued)
Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]
Glass washing	In	2	10	Yes	--
Histology	In	2	6	Yes	No
Microbiology[13]	In	2	6	Yes	No
Nuclear medicine	In	2	6	Yes	No
Pathology	In	2	6	Yes	No
Serology	Out	2	6	--	No
Sterilizing	In	2	10	Yes	--
Autopsy room	In	--	12	Yes	No
Nonrefrigerated body-holding room	In	--	10	Yes	--
Pharmacy	Out	2	4	--	--
DIAGNOSTIC AND TREATMENT					
Examination room	--	--	6	--	--
Medication room	Out	--	4	--	--
Treatment room	--	--	6	--	--

Table 2A (Continued)
Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]
Physical therapy and hydrotherapy	In	--	6	--	--
Soiled workroom or soiled holding	In	--	10	Yes	No
Clean workroom or clean holding	Out	--	4	--	--
STERILIZING AND SUPPLY					
ETO-sterilizer room	In	--	10	Yes	No
Sterilizer equipment room	In	--	10	Yes	--
Central medical surgical supply					
Soiled or decontamination room	In	--	10	Yes	No
Clean workroom	Out	--	4	--	No
Sterile Storage	Out	--	4	--	--
SERVICE					
Food preparation center[14]	--	--	10	--	No
Warewashing	In	--	10	Yes	No
Dietary day storage	In	--	2	--	--

Table 2A (Continued)
Ventilation Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]
Laundry, general	--	--	10	Yes	No
Soiled linen (sorting and storage)	In	--	10	Yes	No
Clean linen storage	Out	--	2	--	--
Soiled linen and trash chute room	In	--	10	Yes	No
Bedpan room	In	--	10	Yes	No
Bathroom	In	--	10	Yes	No
Janitor’s closet	In	--	10	Yes	No

Table 2B
Temperature and Humidity Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

Area designation	Relative humidity[7] (%)	Design temperature[8] (degrees F/C)
SURGERY AND CRITICAL CARE		
Operating/surgical cystoscopic rooms[9]	30-60	68-73 (20-23)
Delivery room[9]	30-60	68-73 (20-23)
Recovery room[9]	30-60	70-75 (21-24)
Critical and intensive care	30-60	70-75 (21-24)
Treatment room[10]	30-60	70-75 (21-24)
Trauma room[10]	30-60	70-75 (21-24)
Endoscopy	30-60	68-73 (20-23)
Bronchoscopy	30-60	68-73 (20-23)
Newborn nursery suite	30-60	75 (24)
X-ray (surgical/critical care and catheterization)	30-60	70-75 (21-24)

Notes: [1]The ventilation rates in this table cover ventilation for comfort, as well as for asepsis and odor control in areas of acute care hospitals that directly affect patient care and are determined based on healthcare facilities being predominantly "No Smoking" facilities. Where smoking may be allowed, ventilation rates will need adjustment. Areas where specific ventilation rates are not given in the table shall be ventilated in accordance with ASHRAE Standard 62-1989, *Ventilation for Acceptable Indoor Air Quality*, and ASHRAE *Handbook of Applications*. Specialized patient care areas, including organ transplant units, burn units, specialty procedure rooms, etc., shall have additional ventilation provisions for air quality control as may be appropriate. OSHA standards and/or NIOSH criteria require special ventilation requirements for employee health and safety within healthcare facilities.

[2]Design of the ventilation system shall provide air movement which is generally from clean to less clean areas. If any form of variable air volume or load shedding system is used for energy conservation, it must not compromise the corridor-to-room pressure balancing relationships or the minimum air changes required by the table. Except where specifically permitted by exit corridor plenum provisions of NFPA 90A, the volume of infiltration and exfiltration from an individual room shall equal 15 percent of the minimum total air changes per hour, as defined by the table, or 50 cfm per door opening, whichever is larger.

[3]To satisfy exhaust needs, replacement air from the outside is necessary. Table 2 does not attempt to describe specific amounts of outside air to be supplied to individual spaces except for certain areas such as those listed. Distribution of the outside air, added to the system to balance required exhaust, shall be as required by good engineering practice. Minimum outside air quantities shall remain constant while the system is in operation.

Table 2B (Continued)
Temperature and Humidity Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

---

[4]Number of air changes may be reduced when the room is unoccupied if provisions are made to ensure that the number of air changes indicated is reestablished any time the space is being utilized. Adjustments shall include provisions so that the direction of air movement shall remain the same when the number of air changes is reduced. Areas not indicated as having continuous directional control may have ventilation systems shut down when space is unoccupied and ventilation is not otherwise needed, if the maximum infiltration or exfiltration permitted in Note 2 is not exceeded and if adjacent pressure balancing relationships are not compromised.

[5]Air from areas with contamination and/or odor problems shall be exhausted to the outside and not recirculated to other areas. Note that individual circumstances may require special consideration for air exhaust to the outside, e.g., in intensive care units in which patients with pulmonary infection are treated, and rooms for burn patients.

*[6]Recirculating room HVAC units refers to those local units that are used primarily for heating and cooling of air, and not disinfection of air. Because of cleaning difficulty and potential for buildup of contamination, recirculating room units shall not be used in areas marked "No." However, for airborne infection control, air may be recirculated within individual isolation rooms if HEPA filters are used. Isolation and intensive care unit rooms may be ventilated by reheat induction units in which only the primary air supplied from a central system passes through the reheat unit. Gravity-type heating or cooling units, such as radiators or convectors shall not be used in operating rooms and other special care areas. See Appendix A for a description of recirculation units to be used in isolation rooms.

[7]The ranges listed are the minimum and maximum limits where control is specifically needed.

[8]Where temperature ranges are indicated, the systems shall be capable of maintaining the rooms at any point within the range. A single figure indicates a heating or cooling capacity of at least the indicated temperature. This is usually applicable when patients may be undressed and require a warmer environment. Nothing in these design standards shall be construed as precluding the use of temperatures lower than those noted when the patients' comfort and medical conditions make lower temperatures desirable. Unoccupied areas such as storage rooms shall have temperatures appropriate for the function intended.

[9]National Institute for Occupational Safety and Health (NIOSH) Criteria Documents regarding Occupational Exposure to Waste Anesthetic Gases and Vapors, and Control of Occupational Exposure to Nitrous Oxide indicate a need for both local exhaust (scavenging) systems and general ventilation of the areas in which the respective gases are utilized.

[10]The term *trauma room* as used here is the operating room space in the emergency department or other trauma reception area that is used for emergency surgery. The first aid room and/or "emergency room" used for initial treatment of accident victims may be ventilated as noted for the "treatment room." Treatment rooms used for Bronchoscopy shall be treated as Bronchoscopy rooms. Treatment rooms used for cryosurgery procedures with nitrous oxide shall contain provisions for exhausting waste gases.

[11]The protective environment airflow design specifications protect the patient from common environmental airborne infectious microbes (i.e., Aspergillus spores). These special ventilation areas shall be designed to provide directed airflow from the cleanest patient care area to less clean areas. These rooms shall be protected with HEPA filters at 99.97 percent efficiency for a 0.3 µm sized particle in the supply airstream. These interrupting filters protect patient rooms from maintenance-derived release of environmental microbes from the ventilation system components. Recirculation HEPA filters can be used to increase the equivalent room air exchanges. Constant volume airflow is required for consistent ventilation for the protected environment. If the facility determines that airborne infection

Table 2B (Continued)
Temperature and Humidity Requirements for Areas Affecting Patient Care in Hospitals and Outpatient Facilities[1]

isolation is necessary for protective environment patients, an anteroom should be provided. Rooms with reversible airflow provisions for the purpose of switching between protective environment and airborne infection isolation functions are not acceptable.

[12]The infectious disease isolation room described in these design standards is to be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. The design of airborne infection isolation (AII) rooms should include the provision for normal patient care during periods not requiring isolation precautions. Supplemental recirculating devices may be used in the patient room, to increase the equivalent room air exchanges; however, such recirculating devices do not provide the outside air requirements. Air may be recirculated within individual isolation rooms if HEPA filters are used. Rooms with reversible airflow provisions for the purpose of switching between protective environment and all functions are not acceptable.

[13]When required, appropriate hoods and exhaust devices for the removal of noxious gases or chemical vapors shall be provided (see Section 7.31.D14. and 15 and NFPA 99).

[14]Food preparation centers shall have ventilation systems whose air supply mechanisms are interfaced appropriately with exhaust hood controls or relief vents so that exfiltration or infiltration to or from exit corridors does not compromise the exit corridor restrictions of NFPA 90A, the pressure requirements of NFPA 96, or the maximum defined in the table. The number of air changes may be reduced or varied to any extent required for odor control when the space is not in use. See Section 7.31.D16.

Table 3
Filter Efficiencies for Central Ventilation and Air Conditioning Systems in General Hospitals and Outpatient Facilities

Area designation	No. filter beds	Filter bed no. 1 (%)	Filter bed no. 2 (%)
All areas for inpatient care, treatment, and diagnosis, and those areas providing direct service or clean supplies such as sterile and clean processing, etc.	2	30	90
Protective environment room	2	30	99.97
Laboratories	1	80	--
Administrative, bulk storage, soiled holding areas, food preparation areas, and laundries	1	30	--

Notes: Additional roughing or prefilters should be considered to reduce maintenance required for filters with efficiency higher than 75 percent. The filtration efficiency ratings are based on dust spot efficiency per ASHRAE 52-92.

Table 4
Hot Water Design

	Clinical	Dietary[1]	Laundry
Liters per second per bed*	.0033	.0020	.0021
Gallons per hour per bed*	3	2	2
Temperature (°C)**	49	60	71**
Temperature (°F)**	120	140	160**

[1] Provisions shall be made to provide 180 °F (82 °C) rinse water at warewasher in accordance with the manufacturer's recommendations and as approved by the authority having jurisdiction. (May be by separate booster.)

* Quantities indicated for design demand of hot water are for general reference minimums and shall not substitute for accepted engineering design procedures using actual number and types of fixtures to be installed. Design will also be affected by temperatures of cold water used for mixing, length of run and insulation relative to heat loss, etc. As an example, total quantity of hot water needed will be less when temperature available at the outlet is very nearly that of the source tank and the cold water used for tempering is relatively warm.

** Provisions shall be made to provide 160 °F (71 °C) hot water at the laundry equipment when needed. (This may be by steam jet or separate booster heater.) However, it is emphasized that this does not imply that all water used would be at this temperature. Water temperatures required for acceptable laundry results will vary according to type of cycle, time of operation, and formula of soap and bleach as well as type and degree of soil. Lower temperatures may be adequate for most procedures in many facilities but the higher 160 °F (71 °C) should be available when needed for special conditions.

Table 5
Station Outlets for Oxygen, Vacuum (Suction), and Medical Air Systems

Section	Location	Oxygen	Vacuum	Med. Air
7.2.A.	Patient Rooms (Medical and Surgical)	1 (one outlet accessible to each bed)	1 (one outlet) accessible to each bed)	--
7.2.B10.	Examination/Treatment (Medical, Surgical, and Postpartum Care)	1	1	--
7.2.C./7.2.D.	Isolation (Infectious and Protective) (Medical and Surgical)	1	1	--
7.2.E.	Seclusion Room (Medical, Surgical, and Postpartum)	1	1	--
7.3.A.	Critical Care (General)	2	3	1
7.3.A14.	Isolation (Critical)	2	3	1
7.3.B.	Coronary Critical Care	2	2	1
7.3.E.	Newborn Intensive Care	3	3	3
7.4.B.	Newborn Nursery (Full-Term)	1	1	1
7.5.A.	Pediatric and Adolescent	1	1	1
7.6.A.	Psychiatric Patient Rooms	--	--	--
7.6.D.	Seclusion Treatment Room	--	--	--
7.7.A1.	General Operating Room	2	3	1
7.7.A2.	Cardio, Ortho, Neurological	2	3	1
7.7.A3.	Orthopedic Surgery	2	3	1
7.7.A4.	Surgical Cysto and Endo	1	3	--

Table 5 (Continued)
Station Outlets for Oxygen, Vacuum (Suction), and Medical Air Systems

Section	Location	Oxygen	Vacuum	Med. Air
7.7.B2.	Post-Anesthetic Care Unit	1	3	--
7.7.C9.	Anesthesia Workroom	1 per workstation	--	1 per workstation
7.7.C14.	Outpatient Recovery	1	1	--
7.8.B2.	Postpartum Bedroom	1	1	--
7.8.A3.	Caesarean/Delivery Room	2	3	1
7.8.A3.d.	Labor Room	1	1	1
7.8.A3.e.	Recovery Room	1	3	--
7.8.A4.	Labor/Delivery/Recovery (LDR)	2	2	1
7.8.A4.	Labor/Delivery/Recovery/Postpartum (LDRP)	2	2	1
7.9.C2.	Initial Emergency Management per bed	1	1	--
7.9.D3.	Triage Area (Definitive Emergency Care)	1	1	1
7.9.D7.	Definitive Emergency Care Exam/Treatment Rooms	1	1	1
7.9.D8.	Trauma/Cardiac Room(s)	2	3	1
7.9.D9.	Orthopedic and Cast Room	1	1	--
7.10.H.	Cardiac Catheterization Lab	1	2	2
7.16.A2.	Autopsy Room	--	1 per workstation	1 per workstation

8. NURSING FACILITIES

8.1. General Conditions

8.1.A. Applicability

This section covers the continuum of nursing services listed below, which may be provided within freestanding facilities or as distinct parts of a general hospital or other health care facility, and represents minimum requirements for new construction and shall not be applied to existing facilities unless major construction renovations (see Section 1.2.A.) are undertaken.

The continuum of nursing services and facilities may be distinguished by the levels of care, staffing support areas and service areas provided and classified as:

Nursing and skilled nursing facilities
Special Programs, including:
Subacute care facilities 8.7.
Alzheimer's and other dementia units 8.8.
Dialysis Services 8.33.

***Note*:** Specific requirements for each of the above special care facility types are addressed in the paragraphs noted above.
For basic requirements, see Chapters 1 through 6.

*8.1.B. Ancillary Services (Not Used)

*8.1.C. Hospital Conversions (Not Used)

8.1.D. Site

See Section 3.1.

8.1.E. Roads

Paved roads shall be provided within the property for access to all entrances and to loading and unloading docks (for delivery trucks). Paved walkways shall be provided for pedestrian traffic.

8.1.F. Parking

In the absence of local requirements, each nursing facility shall have parking space to satisfy the needs of residents, employees, staff, and visitors. The facility shall provide a minimum of one space for every four beds.

8.1.G. Operational Narrative

The sponsor for each project shall provide an operational narrative for the facility. (See Section 1.1.C. of this document.)

8.1.H. Services

Each nursing facility shall, as a minimum, contain the elements described within the applicable paragraphs of this chapter.

8.1.I. Renovation

See Section 1.2.

8.1.J. Provisions for Disasters

See Section 1.4.

8.1.K. Codes and Standards

See Section 1.5.

8.1.L. (Not Used)

8.1.M. Equipment

See Chapter 4.

8.1.N. Construction

See Chapter 5.

8.1.O. Record Drawings and Manuals

See Chapter 6.

8.2. Resident Unit

Each resident unit shall comply with the following.

***8.2.A. Size and Configuration**

Maximum travel distance from the staff station to a resident room door shall be 120 feet (45.72 meters). Arranging groups of resident rooms adjacent to decentralized service areas, optional satellite staff work areas, and optional decentralized resident support areas is acceptable.

8.2.B. Resident Rooms

Each resident room shall meet the following requirements.

8.2.B1. Maximum room occupancy in renovations (less than 50 percent change) shall be four residents, two residents in new construction.

*8.2.B2. Room size and configuration shall permit resident(s) options for bed location(s), make provision for visual privacy, and shall not be less than 120 square feet (11.15 square meters) in single-bed rooms and 100 square feet (9.29 square meters) per bed in multiple-bed rooms (exclusive of toilets, closets, lockers, wardrobes, alcoves or vestibules, in both cases). In renovations, minimum room areas (exclusive of toilets, closets, lockers, wardrobes, alcoves, or vestibules) shall be 100 square feet (9.29 square meters) in single-bed rooms and 80 square feet (7.43 square meters) per bed in multiple-bed rooms. In multiple-bed rooms, clearance shall allow for the movement of beds and equipment without disturbing residents. A resident room shall have not less than a 3-foot (0.91 meter) clearance available on both sides and at the foot of each bed.

8.2.B3. Each room shall have a window that meets the requirements of Section 7.28.A10.

8.2.B4. Handwashing facilities consistent with Section 2.1.A. shall be provided in each resident room. They may be omitted from single-bed or two-bed rooms when such is located in an adjoining toilet room serving that room only.

8.2.B5. Each resident room shall have access to a toilet room without having to enter the general corridor area. One toilet room shall serve no more than four beds and no more than two resident rooms. The toilet room shall contain a water closet and a handwashing facility and the door shall swing outward or be double acting.

8.2.B6. Each resident room shall provide a minimum of 5 square feet (0.46 square meter) of floor space per bed for wardrobe and closet, in addition to other requirements for usable floor space per bed.

8.2.B7. In multiple-bedrooms, visual privacy from casual observation by other residents and visitors shall be provided for each resident. The design for privacy shall not restrict resident access to the entrance, lavatory, toilet room, or wardrobe.

8.2.B8. Beds shall be no more than two deep from windows in new construction and three deep from windows in renovated construction.

8.2.B9. (Not Used)

8.2.B10. The need for and number of required airborne infection isolation room(s) in nursing facilities shall be determined by an infection control risk assessment. When required, the airborne infection isolation room(s) shall comply with the general requirements of Section 7.2.C.

*8.2.B11. Each nursing facility shall have at least one single-bed resident room with attached lavatory, water closet, and bathing facility reserved for the use of the occupant of the room only.

***8.2.C. Service Areas**

The services listed below shall be provided in each nursing unit. These services shall be in or readily available to each resident module.

*8.2.C1. Staff work area(s). Resident units shall have staff work areas in central or decentralized direct care locations. Where care giving is organized on a central staffing model, such work areas shall have space for charting, storage, and administrative activities. Where care giving is decentralized, supervisory work areas need not accommodate charting activities, nor have direct visualization of resident rooms; such functions shall be accomplished at the decentralized direct care staff work areas, which shall have space for charting and any storage or administrative functions required by the operational narrative.

8.2.C2. Service areas shall be provided consistent with the requirements of Section 2.1.H2., 3, 6, 7, 8, 9, 10 and 12.

8.2.C3. (Not Used)

8.2.C4. Staff lounge area(s). These areas shall be provided and may be shared by more than one resident unit or service.

8.2.C5. (Not Used)

8.2.C6. (Not Used)

8.2.C7. (Not Used)

8.2.C8. (Not Used)

*8.2.C9. (Not Used)

8.2.C10. (Not Used)

8.2.C11. Resident bathing facilities. A minimum of one bathtub or shower shall be provided for every 20 residents (or fraction thereof) not otherwise served by bathing facilities in resident rooms.

Residents shall have access to at least one central bathing room per floor or unit, sized to permit assisted bathing in a tub or shower. The bathtub in this room shall be accessible to residents in wheelchairs and the shower shall accommodate a shower gurney with fittings for a resident in a recumbent position.

Showers or tubs shall be in individual rooms or enclosures with space for private use of the bathing fixtures, for drying and dressing and access to a grooming location containing a sink, mirror and counter or shelf.

A water closet and handwashing facility consistent with Section 2.1.A. shall be provided within or directly accessible to each resident's bathing facility without requiring entry into the general corridor.

8.3. Resident Support Areas

***8.3.A. Area Need**

A minimum of 30 square feet (2.79 square meters) of floor space per resident bed shall be provided for dayroom, dining, recreation, and activity purposes with a minimum total area of at least 225 square feet (20.9 square meters). At least 20 square feet (1.86 square meters) per resident bed of this space shall be available for dining.

8.3.B. Storage

A minimum of 10 square feet (0.93 square meter) per bed of general storage space(s) for supplies, resident needs, and recreation shall be provided in one or more individual weatherproof buildings on-site.

***8.4. Activities (Not Used)**

8.5. Rehabilitation Therapy

Each nursing facility which provides physical and/or occupational therapy services for rehabilitating long-term care residents shall have areas and equipment consistent with the operational narrative. Where the nursing facility is part of a general hospital or other facility, services may be shared as appropriate.

8.5.A. Physical and Occupational Therapy Provisions: (Inpatient/Outpatient)

As a minimum, the following shall be located on-site, convenient for use.

8.5.A1. Space for files, records, and administrative activities

8.5.A2. (Not Used)

8.5.A3. Storage for supplies and equipment

8.5.A4. Handwashing facilities consistent with Section 2.1.A. within the therapy unit.

8.5.A5. (Not Used)

8.5.A6. Provisions for resident privacy

8.5.A7. Housekeeping rooms, consistent with Section 2.1.H17.

8.5.A8. A barrier-free resident toilet room convenient to the unit

8.5.B. Physical and Occupational Therapy for Outpatients

If the program includes outpatient treatment, additional provisions shall include:

8.5.B1. Convenient facility access usable by the disabled

8.5.B2. Lockers for storing patients' clothing and personal effects

8.5.B3. Outpatient facilities for dressing

8.5.B4. (Not Used)

*__8.6. Personal Services (Barber/Beauty) Areas__

Facilities and equipment for resident hair care and grooming shall be provided separate from the resident rooms.

__*8.7. Subacute Care Facilities (Not Used)__

__*8.8. Alzheimer's and Other Dementia Units (Not Used)__

__8.9. Dietary facilities shall be consistent with the requirements of Section 7.18.__

__8.10. Administrative and Public Areas__

The following shall be provided.

__8.10.A.__ (Not Used)

__8.10.B.__ Administrative/Lobby Area

This shall include:

a. A counter or desk for reception and information

b. Public waiting area(s)

c. Public toilet facilities

d. Public telephone(s)

e. Drinking fountain(s)

__8.10.C. General or Individual Office(s)__

These shall be provided for business transactions, admissions, social services, medical and financial records, and administrative and professional staff. There shall be included provisions for private interviews.

__8.10.D. Multipurpose Room(s)__

There shall be a multipurpose room for conferences, meetings, staff development, and health education purposes as required by the operational narrative; it shall include provisions for the use of visual aids. One multipurpose room may be shared by several services.

__8.10.E. Clerical files, staff work area, and storage area__ for office equipment and supplies shall be provided.

8.10.F. **(Not Used)**

8.11. **Linen services** consistent with the requirements of Section 7.23. shall be provided.

8.12. **Housekeeping Rooms**

Housekeeping rooms consistent with the requirements of Section 2.1.H17. shall be provided. There shall be at least one housekeeping room for each floor.

8.13. **Engineering service and equipment areas** consistent with the requirements of Section 7.27. shall be provided.

***8.14.** **General Standards for Details and Finishes**

8.14.A. **Details**

8.14.A1. See Section 7.28.A3.

8.14.A2. See Sections 7.28.A6. and 7.28.A8.

8.14.A3. See Section 7.28.A9.

8.14.A4. Resident rooms or suites and day/dining/activity rooms shall have windows consistent with the requirements of Section 7.28.A10.

*8.14.A5. (Not Used)

8.14.A6. See Section 7.28.A13.

*8.14.A7. See Section 7.28.A14.

*8.14.A8. Handrails with end returns shall be provided on both sides of all corridors normally used by residents. A minimum clearance of 1-1/2 inches (3.81 cm) shall be provided between the handrail and the wall. Handrails shall be finished to minimize potential for personal injury.

8.14.A9. (Not Used)

8.14.A10. Lavatories, handwashing facilities and handrails which a resident could use for support shall be securely anchored.

*8.14.A11. Each resident handwashing facility shall have a mirror. Mirror placement shall allow for convenient use by both wheelchair occupants and/or ambulatory persons.

8.14.A12. (Not Used)

8.14.A13. See Section 7.28.A20.

8.14.A14. See Section 7.28.A22.

8.15. **Finishes**

8.15.A. **(Not Used)**

8.15.B. **(Not Used)**

8.15.C. **See Section 7.28.B4.**

8.15.D. **(Not Used)**

8.15.E. **See Section 7.28.B6.**

8.15.F. **See Section 7.28.B7.**

8.15.G. The finishes of all exposed ceilings and ceiling structures in resident rooms and staff work areas shall be readily cleanable with routine housekeeping equipment. Finished ceilings shall be provided in all resident bedrooms and care areas where dust fallout might create a problem.

8.15.H. **(Not Used)**

8.16. **Reserved**

8.17. **Reserved**

8.18. **Reserved**

8.19. **Reserved**

8.20. **Reserved**

8.21. **Reserved**

8.22. **Reserved**

8.23. **Reserved**

8.24. **Reserved**

8.25. **Reserved**

8.26. **Reserved**

8.27. **Reserved**

8.28. **Reserved**

8.29. **Reserved**

8.30. **Special Systems**

8.30.A. **General** (Not Used)

8.30.A1. (Not Used)

8.30.A2. (Not Used)

8.30.A3. (Not Used)

8.30.B. Elevators

8.30.B1. All buildings having resident use areas on more than one floor shall have electric or hydraulic elevator(s).

a. Engineered traffic studies are recommended. In the absence of an engineered traffic study, the following guidelines for number of elevators shall apply:

i. At least one elevator shall be installed that has inside dimensions that accommodate a resident bed with attendants, where residents are housed on any floor other than the main entrance floor. The clear inside dimension of such cars shall be at least 5 feet (1.53 meters) wide by 7 feet 6 inches (2.29 meters) deep. Car doors shall have a clear opening of not less than 3 feet 8 inches (1-12 meters).

ii. When 60 to 200 residents are housed on floors other than the main entrance floor, at least two elevators consistent with Section 8.30.B1.a.i. shall be installed.

iii. When 201 to 350 residents are housed on floors other than main entrance floor, at least three elevators, consistent with Section B.30.B1.a.i. shall be installed.

iv. For facilities with more than 350 residents housed above the main entrance floor, the number of elevators shall be determined from a facility plan study and from the estimated vertical transportation requirements.

v. When the nursing facility is part of a general hospital, elevators may be shared, and the standards of Section 7.30. shall apply.

vi. In renovations, existing elevators that can accommodate resident beds used in the facility will not be required to be increased in size.

*8.30.B2. All elevators required for passenger service shall be constructed to accommodate wheelchairs.

8.30.B3. See Section 7.30.B3.

8.30.C. Waste Processing Service - See Section 7.30.C.

8.31. Mechanical Standards

8.31.A. General

*8.31.A1. The HVAC systems shall be designed to achieve and meet occupancy comfort conditions in accordance with Tables 6A and 6B, and filtration efficiencies in accordance with Table 7.

*8.31.A2. (Not Used)

*8.31.A3. (Not Used)

8.31.A4. (Not Used)

8.31.A5. (Not Used)

8.31.A6. See Section 7.31.A7.

8.31.B. Thermal and acoustical insulation consistent with the requirements of Section 7.31.B. shall be provided.

8.31.C. Steam and hot water systems consistent with the requirements of Section 7.31.C. shall be provided.

8.31.D. Air Conditioning, Heating, and Ventilation Systems

*8.31.D1. The ventilation system for the space shall be adequate to maintain the space condition based on space load requirements, but be no less than the requirements of Tables 6A and 6B. Table 7 filtration efficiencies shall also be used.

Airflow shall be controlled and maintained to ensure movement of air from "clean" to "less clean" areas. All rooms used for resident care shall be temperature controlled and shall comply with the standards set in Table 6B. When humidification is provided, steam humidifiers shall be used. Reservoir-type water spray or evaporative pan humidifiers shall not be used.

8.31.D2. See 7.31.D2.

8.31.D3. See 7.31.D3.

8.31.D4. (Not Used)

8.31.D5. Filter efficiencies shall be tested consistent with ASHRAE 52.1-92. Filter frames shall be durable and proportioned to provide an airtight fit with the enclosing ductwork. All joints between filter segments and the enclosing duct work shall have gaskets or seals to provide a positive seal against air leakage. A manometer or other means to monitor pressure differential shall be installed across each filter bed having a required efficiency of 75 percent or more.

8.31.D6. See Section 7.31.D10.

8.31.D7. (Not Used)

*8.31.D8. Individual room units that are used for heating and cooling purposes (fan-coil units, heat pump units, etc.) shall be equipped with cleanable or replaceable filters.

The filters shall have a minimum efficiency of 25 percent based on ASHRAE 52.1-92 atmospheric dust spot efficiency. These units may be used as recirculating units only. All outdoor air requirements shall be met by a separate central air handling system with the proper filtration, as noted in Table 7.

8.31.D9. See 7.31.D20.

8.31.E. Plumbing and Other Piping Systems. Unless otherwise specified herein, all plumbing systems shall be designed and installed in accordance with the authority having jurisdiction.

8.31.E1. See. 7.31.E1.

8.31.E2. The following standards shall apply to potable water supply systems:

a. (Not Used)

b. Each water service main, branch main, riser, and branch to a group of fixtures shall have valves. Stop valves shall be provided for each fixture. Appropriate panels for access shall be provided at all valves, where required.

c. Backflow preventers (vacuum breakers) shall be installed on hose bibbs and supply nozzles used for connection of hoses or tubing in and at other locations where the potable water supply must be protected from contamination.

d. Potable water storage vessels (hot and cold) not intended for constant use shall not be installed.

8.31.E3. See Section 7.31.E3.

8.31.E4. The following standards shall apply to drainage systems:

a. (Not Used)

b. Building sewers shall discharge into community sewerage. Where such a system is not available, the facility shall treat its sewage in accordance with local and state regulations. (See Section 3.1.D.).

c. Kitchen grease traps shall be located and arranged to permit easy access.

8.31.E5. Any installation of nonflammable medical gas, air, or clinical vacuum systems shall comply with the requirements of NFPA 99. When any piping or supply of medical gases is installed, altered, or augmented, the altered zone shall be tested and certified as required by NFPA 99.

8.31.E6. See Section 7.31.E7.

8.32. Electrical Standards

8.32.A. General

8.32.A1. See Section 7.32.A1.

8.32.A2. (Not Used)

8.32.A3. (Not Used)

8.32.A4. Lighting

*a. Lighting shall meet or exceed the minimum illumination levels listed in Table 12.

*b. Sufficient light for an exterior ramp, step, and porch shall be provided for safety of persons using the facilities.

*c. Resident rooms and adjacent toilet rooms shall have general lighting and night lighting. A reading light shall be provided for each resident. Reading light controls shall be readily accessible to the resident(s). Incandescent and halogen light sources which produce heat shall be avoided to prevent burns to the resident and/or bed linen. Flexible light arms, if used, shall be mechanically controlled to prevent the lamp from contacting the bed linen.

d. Resident unit corridors shall have general illumination with provisions for reducing light levels at night.

e. Light fixtures shall be equipped with lenses or shields for protection of the lamps or with lamps which will not shatter.

8.32.A5. Receptacles (Convenience Outlets)

a. Each resident room shall have duplex-grounded receptacles. There shall be one at each side of the head of each bed and one on each other wall. Receptacles may be omitted from exterior walls where construction makes installation impractical.

b. Duplex-grounded receptacles for general use shall be installed approximately 50 feet (15.24 meters) apart in all corridors and within 25 feet (7.62 meters) of corridor ends.

c. Electrical receptacles supplied from the emergency system shall be distinctively colored or marked for identification. If color is used for identification purposes, the same color shall be used throughout the facility.

d. Ground-fault-interrupters shall comply with NFPA 70.

8.32.B. (Not Used)

8.32.C. (Not Used)

8.32.D. (Not Used)

8.32.E. (Not Used)

8.32.F. (Not Used)

8.32.G. Nurse/Staff Call System

A nurse/staff call system shall be provided. Each bed location and/or resident shall be provided with a call device. Two-call devices serving adjacent beds or residents may be served by one calling station. Calls shall be initiated by a resident activating either a call device attached to a resident's calling station, or a portable device which sends a call signal to the calling station and shall either:

(a) Activate a visual signal in the corridor at the resident's door or other appropriate location. In multi-corridor or cluster resident units, additional visual signals shall be installed at corridor intersections, or

*(b) Activate a pager worn by a staff member, identifying the specific resident and/or room from which the call has been placed.

An emergency call station shall be provided at each resident toilet, bath, sitz bath, and shower room. This station shall be accessible to a resident lying on the floor. Inclusion of a pull cord or portable radio frequency push-button will satisfy this standard.

The emergency call system shall be designed so that a call activated by a resident will initiate a signal distinct from the regular staff call system and that can be turned off only at the resident's location. The signal shall activate an annunciator panel or screen at the staff work area or other appropriate location, and either a visual signal in the corridor at the resident's door or other appropriate location, or a staff pager indicating the calling resident's name and/or room location, and at other areas defined by the operational narrative.

Alternate technologies can be considered for emergency or nurse call systems subject to the approval by the authority having jurisdiction.

8.32.H. Emergency Electrical Service

8.32.H1. As a minimum, nursing facilities or sections thereof shall have emergency electrical systems, as required in NFPA 101 and Chapter 16 of NFPA 99. Emergency electrical service shall be capable of providing not less than 4 hours of service at full load. It shall serve lights at nursing stations, telephone switchboards, night lights, exit and corridor lights, heating plant controls, and other critical mechanical equipment essential to the safety and welfare of residents, personnel, and visitors in the home.

8.32.H2. When the nursing facility is a distinct part of an acute-care hospital, it may use the emergency generator system for required emergency lighting and power, if such sharing does not reduce hospital services. Life support systems and their respective areas shall be subject to applicable standards of Section 7.32.

8.32.H3. An emergency electrical source shall provide lighting and/or power during an interruption of the normal electric supply. Where stored fuel is required, storage capacity shall permit continuous operation for at least 24 hours. Fuel storage for electricity generation shall be separate from heating fuels.

8.32.H4. Local codes and regulations may have additional requirements.

*8.32.H5. Exhaust systems (including locations, mufflers, and vibration isolators) for internal combustion engines shall be designed and installed to minimize objectionable noise and odors.

8.32.I. Fire Alarm System (Not Used)

8.32.J. Telecommunication and Information Systems

832.J1. Cable and routing shall meet applicable fire code.

8.32.J2. A secured room shall be provided for central equipment locations.

8.33. Dialysis Services - When included in the operational narrative, provisions for on-site dialysis services shall be made, consistent with Section 7.14.

Table 6A
Ventilation of Certain Areas of Nursing Facilities[1]

Function Area	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]
Resident room	--	2	2	--	--
Resident unit corridor	--	--	2	--	--
Toilet Room	In	--	10	Yes	--
Airborne infectious isolation rooms, if provided	In	2	12	Yes	No
Isolation alcoves or anterooms, if provided[11]	In/Out	--	10	Yes	No
Dining rooms	--	2	2	--	--
Activity rooms, if provided	--	2	2	--	--
Physical therapy	In	2	6	--	--
Occupational therapy	In	2	6	--	--
Soiled workroom or soiled holding	In	2	10	Yes	No
Clean workroom or clean holding	Out	2	4	--	--
Medication room	Out	2	4	--	--
Sterilizer exhaust room	In	--	10	Yes	No
Linen and trash chute room if provided	In	--	10	Yes	No
Laundry, general, if provided	--	2	10	Yes	No

Table 6A (Continued)
Ventilation of Certain Areas of Nursing Facilities[1]

Function Area	Air movement relationship to adjacent area[2]	Minimum air changes of outdoor air per hour[3]	Minimum total air changes per hour[4]	All air exhausted directly to outdoors[5]	Recirculated by means of room units[6]
Soiled linen sorting and storage	In	--	10	Yes	No
Clean linen storage	Out	--	2	Yes	No
Food preparation facilities[12]	--	2	10	--	No
Dietary warewashing	In	--	10	Yes	No
Dietary storage areas	--	--	2	Yes	No
Housekeeping rooms	In	--	10	Yes	No
Bathing rooms	In	--	10	Yes	No

Table 6B
Temperature and Humidity of Certain Areas of Nursing Facilities[1]

Function Area	Relative humidity[7] (%)	Design Temperature[8] (degrees F/C)
Resident room	[9]	71-81 (22-27)
Resident unit corridor	[9]	--
Toilet Room	--	75
Airborne infectious isolation rooms, if provided	--	71-81 (22-27)
Isolation alcoves or anterooms, if provided[11]	--	--
Dining rooms	--	75
Activity rooms, if provided	--	75
Physical therapy	--	75(24)
Occupational therapy	--	75(24)
Soiled workroom or soiled holding	--	--
Clean workroom or clean holding	--	75(24)
Medication room	--	--
Sterilizer exhaust room	--	--
Linen and trash chute room if provided	--	--
Laundry, general, if provided	--	80 (27)
Soiled linen sorting and storage	--	--
Clean linen storage	--	--
Food preparation facilities[12]	--	80 (27)
Dietary warewashing	--	--
Dietary storage areas	--	--
Housekeeping rooms	--	--
Bathing rooms	--	75(24)

Table 6B (Continued)
Temperature and Humidity of Certain Areas of Nursing Facilities[1]

Notes:

[1]The ventilation rates in this table cover ventilation for comfort, as well as for asepsis and odor control in areas of nursing facilities that directly affect resident care and are determined based on nursing facilities being predominantly "No Smoking" facilities. Where smoking may be allowed, ventilation rates will need adjustments. Areas where specific ventilation rates are not given in the table shall be ventilated in accordance with ASHRAE Standard 62, *Ventilation for Acceptable Indoor Air Quality*, and ASHRAE *Handbook of Applications.* OSHA standards and/or NIOSH criteria require special ventilation requirements for employee health and safety within nursing facilities.

[2]Design of the ventilation system shall provide air movement which is generally from clean to less clean areas. If any form of variable air volume or load shedding system is used for energy conservation, it must not compromise the corridor-to-room pressure balancing relationships or the minimum air changes required by the table. Except where specifically permitted by exit corridor plenum provisions of NFPA 90A, the volume of infiltration and exfiltration from an individual room shall equal 15 percent of the minimum total air changes per hour as defined by the table, or 50 cfm per door opening, whichever is larger.

[3]To satisfy exhaust needs, replacement air from outside is necessary. Table 6 does not attempt to describe specific amounts of outside air to be supplied to individual spaces except for certain areas such as those listed. Distribution of the outside air, added to the system to balance required exhaust, shall be as required by good engineering practice.

[4]Number of air changes may be reduced when the room is unoccupied if provisions are made to ensure that the number of air changes indicated is reestablished any time the space is being utilized. Adjustments shall include provisions so that the direction of air movement shall remain the same when the number of air changes is reduced. Areas not indicated as having continuous directional control may have ventilation systems shut down when space is unoccupied and ventilation is not otherwise needed.

[5]Air from areas with contamination and/or odor problems shall be exhausted to the outside and not recirculated to other areas. Note that individual circumstances may require special consideration for air exhaust to outside.

[6]Because of cleaning difficulty and potential for buildup of contamination, recirculating room units shall not be used in areas marked "No." Isolation rooms may be ventilated by reheat induction units in which only the primary air supplied from a central system passes through the reheat unit. Gravity-type heating or cooling units such as radiators or convectors shall not be used in special care areas.

[*7]The ranges listed are the minimum and maximum limits where control is specifically needed. See A8.31.D1. for additional information.

[8]Where temperature ranges are indicated, the systems shall be capable of maintaining the rooms at any point within the range. A single figure indicates a heating or cooling capacity of at least the indicated temperature. This is usually applicable where residents may be undressed and require a warmer environment. Nothing in these design standards shall be construed as precluding the use of temperatures lower than those noted when the residents' comfort and medical conditions make lower temperatures desirable. Unoccupied areas such as storage rooms shall have temperatures appropriate for the function intended.

[*9]See A8.31.D1.

Table 6B (Continued)
Temperature and Humidity of Certain Areas of Nursing Facilities[1]

[*10]The protective environment airflow design specifications protect the patient from common environmental airborne infectious microbes (i.e., Aspergillus spores). These special ventilation areas shall be designed to provide directed airflow from the cleanest patient care area to less clean areas. These rooms shall be protected with HEPA filters at 99.97 percent efficiency for a 0.3 µm sized particle in the supply airstream. These interrupting filters protect patient rooms from maintenance-derived release of environmental microbes from the ventilation system components. Recirculation HEPA filters can be used to increase the equivalent room air exchanges. Constant volume airflow is required for consistent ventilation for the protected environment. If the facility determines that airborne infection isolation is necessary for protective environment patients, an anteroom shall be provided. Rooms with reversible airflow provisions for the purpose of switching between protective isolation and airborne infection isolation functions are not acceptable.

[11]The infectious disease isolation room described in these design standards is to be used for isolating the airborne spread of infectious diseases, such as measles, varicella, or tuberculosis. The design of airborne infection isolation (AII) rooms should include the provision for normal patient care during periods not requiring isolation precautions. Supplemental recirculating devices may be used in the patient room, to increase the equivalent room air exchanges; however, such recirculating devices do not provide the outside air requirements. Air may be recirculated within individual isolation rooms if HEPA filters are used. Rooms with reversible airflow provisions for the purpose of switching between protective isolation and airborne infection isolation functions are not acceptable.

[12]Food preparation facilities shall have ventilation systems whose air supply mechanisms are interfaced appropriately with exhaust hood controls or relief vents so that exfiltration or infiltration to or from exit corridors does not compromise the exit corridor restrictions of NFPA 90A, the pressure requirements of NFPA 96, or the maximum defined in the table. The number of air changes may be reduced or varied to any extent required for odor control when the space is not in use.

Table 7
Filter Efficiencies for Central Ventilation and Air Conditioning Systems in Nursing Facilities

Area Designation	Minimum number of filter beds	Filter efficiencies (%)	
		Filter bed no. 1	Filter bed no. 2
All areas for inpatient care, treatment, and/or diagnosis, and those areas providing direct service or clean supplies	2	30	80
Administrative, bulk storage, soiled holding, laundries, food preparation areas	1	30	

Note: The filtration efficiency ratings are based on dust spot efficiency per ASHRAE 52-92.

9. OUTPATIENT FACILITIES

9.1. General

9.1.A. Section Applicability

This section applies to the outpatient unit in a hospital or a freestanding surgical outpatient facility within a nonmedical facility, or part of a health maintenance organization (HMO) or other health service. This section does not apply to the offices of private-practice physicians in commercial office space and should not be applied to such offices in ancillary outpatient facilities.

The general standards set forth in Sections 9.1. and 9.2. apply to each of the items below. Additions and/or modifications shall be made as described for the specific facility type.

Specialty facilities, such as those for renal dialysis, cancer treatment, mental health, rehabilitation, etc., have needs that are not addressed here. They must satisfy additional conditions to meet respective programs' standards.

Specifically described are:

9.1.A1. Primary Care Outpatient Center (Section 9.3.)

9.1.A2. The Small Primary (Neighborhood) Outpatient Facility (Section 9.4.)

9.1.A3. The Outpatient Surgical Facility (Section 9.5.)

9.1.A4. The Freestanding Emergency Facility (Section 9.6.)

9.1.A5. Freestanding Birthing Center (Section 9.7.)

9.1.B. Outpatient Facility Classification

Except for the emergency unit, the outpatient facilities described herein are used primarily by patients capable of traveling into, around, and out of the facility unassisted. This includes the disabled confined to wheelchairs. Occasional facility use by stretcher patients should not be used as a basis for more restrictive institutional occupancy classifications.

Facilities shall comply with the "Ambulatory Health Care Centers" Section of NFPA 101, in addition to details herein, where patients incapable of self-preservation or those receiving inhalation anesthesia are treated. The "Business Occupancy" section of NFPA 101 applies to other types of outpatient facilities. Outpatient units that are part of another facility may be subject to the additional requirements of the other occupancy.

References are made to Section 7., General Hospital, for certain service spaces, such as the operating rooms of the outpatient surgical unit. Those references are intended only for the specific areas indicated.

9.1.C. Facility Access

Where the outpatient unit is part of another facility, separation and access shall be maintained as described in NFPA 101. Building entrances used to reach the outpatient services shall be at grade level, clearly marked, and located so that patients need not go through other activity areas. (Lobbies of multi-occupancy buildings may be shared.) Design shall preclude unrelated traffic within the unit.

9.1.D. Operational Narrative Provision

Each project sponsor shall provide an operational narrative for the facility. (See Section 1.1.C.)

9.1.E. (Not Used)

9.1.F. Location

A facility shall be located no more than 30 minutes normal travel time from the Hospital with which written emergency admission arrangements are made.

Community outpatient units shall be conveniently accessible to patients and staff via available public transportation.

9.1.G. Parking

Each new facility, major addition, or major change in function shall have parking space to satisfy the needs of patients, personnel, and public. A formal parking study is desirable. In the absence of a formal parking study, parking for outpatient facilities shall be provided at the rate noted for each type of unit.

9.1.H. Privacy for Patients

Each facility design shall ensure patient visual privacy and dignity during interviews, examinations, treatment, and recovery.

Audible privacy is the objective for all open interview, registration or discharge areas.

Noise reduction criteria shown in Table 1 of Chapter 7 for patient rooms shall apply to partitions, floors, and ceiling construction in all separate interview, examination, treatment and recovery areas.

9.2. Common Elements for Outpatient Facilities

The following shall apply to each outpatient facility described herein with additions and/or modifications as noted for each specific type. Special consideration shall be given to needs of children for pediatric services.

9.2.A. Administration and Public Areas

9.2.A1. (Not Used)

9.2.A2. Public services shall include:

a. Conveniently accessible wheelchair storage out of the path of normal traffic

b. A reception and information counter or desk

c. Waiting space(s). Where an organized pediatric service is part of the outpatient facility, provisions shall be made for separating pediatric and adult patients.

d. Conveniently accessible public toilet rooms

e. Conveniently accessible public telephone(s)

f. Conveniently accessible drinking fountain(s)

9.2.A3. Interview space(s) for private interviews related to social service, credit, etc., shall be provided.

9.2.A4. General or individual office(s) for business transactions, records, administrative, and professional staffs shall be provided. These shall be separate from public and patient areas with provisions for confidentiality of records. Enclosed office spaces for administration and consultation shall be provided.

9.2.A5. Clerical space or rooms for typing, clerical work, and filing, separated from public areas for confidentiality, shall be provided.

9.2.A6. Multipurpose room(s) equipped for visual aids shall be provided for conferences, meetings, and health education purposes.

9.2.A7. Special storage for staff personal effects with locking drawers or cabinets (may be individual desks or cabinets) shall be provided.

9.2.A8. General storage facilities for supplies and equipment shall be provided.

9.2.B. Clinical Facilities

The following elements shall be provided.

9.2.B1. General-purpose examination room(s). For medical, obstetrical, and similar examinations, rooms shall have a minimum floor area of 80 square feet (7.43 square meters), excluding vestibules, toilet rooms, and closets. Room arrangement shall permit at least 2 feet 8 inches (81.28 cm) clearance at each side and at the foot of the examination table. Handwashing facilities consistent with 2.1.A. and a counter or shelf space for writing shall be provided.

9.2.B2. Special-purpose examination rooms. Rooms for special clinics such as eye, ear, nose, and throat examinations, if provided, shall be designed and outfitted to accommodate procedures and equipment used. Handwashing facilities consistent with 2.1.A., and a counter or shelf space for writing shall be provided.

9.2.B3. Treatment room(s) shall have a minimum floor area of 120 square feet (11.15 square meters), excluding vestibules, toilet rooms, and closets. Handwashing facilities consistent with 2.1.A. and a counter or shelf for writing shall be provided. If a sink is used for the disposal of plaster of Paris, a plaster trap shall be provided.

9.2.B4. Observation room(s). Observation rooms for the seclusion of disturbed patients shall have a minimum floor area of 80 square feet (7.43 square meters) and shall be convenient to a nurse or control station. An examination room may be used to accommodate this function.

9.2.B5. Nurses station(s). A work counter, communication system, space for supplies, and provisions for charting shall be provided.

9.2.B6. Drug distribution station. This may be a part of the nurses station and shall include a work counter, sink, refrigerator, and locked storage for biologicals and drugs.

9.2.B7. Clean storage. A separate room for storing clean and sterile supplies shall be provided.

9.2.B8. Soiled holding. A separate room shall be provided for collection, storage, and disposal of soiled materials.

9.2.B9. Sterilizing facilities. A system for sterilizing equipment and supplies shall be provided.

9.2.B10. Wheelchair storage space. Such storage shall be out of the direct line of traffic.

9.2.B11. The need for and number of required airborne infection isolation rooms shall be determined by an infection control risk assessment, as defined in Section 2.1.G. When required, the airborne infection isolation room(s) shall comply with the general requirements of Section 7.2.C.

9.2.C. Radiology (See Section 7.10.)

9.2.C1. Radiographic room(s). See Section 7.10.A1. for special requirements.

9.2.C2. Film processing facilities shall be provided consistent with the requirements of Section 7.10.B9.

9.2.C3. Viewing and administrative areas(s) shall be provided consistent with the requirements of Section 7.10.B10.

9.2.C4. A film storage space shall be provided consistent with the requirements of Section 7.10.B6.

9.2.C5. Toilet rooms with handwashing facilities consistent with the requirements of Section 2.1.A. shall be provided with direct access from each ultrasound and fluoroscopic room.

9.2.C6. Dressing rooms or booths with convenient toilet room access shall be provided.

9.2.D. Laboratory (See Section 7.12.)

Facilities shall be provided within the outpatient department, or through an effective contract arrangement with a hospital or laboratory service. If these services are provided on contract, the following laboratory facilities shall also be provided in (or be immediately accessible to) the outpatient facility.

9.2.D1. Laboratory work counter(s) with sink.

9.2.D2. Lavatory(ies) or counter sink(s) equipped for handwashing consistent with the requirements of Section 2.1.A.

9.2.D3. Storage cabinet(s) or closet(s).

9.2.D4. Specimen collection facilities with a water closet and lavatory. Blood collection facilities shall have seating space, a work counter, and handwashing facilities consistent with the requirements of Section 2.1.A.

9.2.E. Housekeeping Room(s)

In addition to the housekeeping rooms required in certain departments, sufficient housekeeping rooms consistent with the requirements of Section 2.1.H17. shall be provided throughout the facility, as required to maintain a clean and sanitary environment. There shall not be less than one housekeeping room for each floor.

9.2.F. Staff Facilities

Staff locker rooms and toilet rooms shall be provided.

9.2.G. Engineering Service and Equipment Areas

The following shall be provided.

9.2.G1. Equipment room(s) for boilers, mechanical equipment, and electrical equipment.

9.2.G2. Storage room(s) for supplies and equipment.

9.2.G3. Waste processing services consistent with the requirements of Section 7.30.C. shall be provided.

9.2.H. Details and Finishes

*9.2.H1. In addition to the following, details shall be consistent with the requirements of Sections 7.28.A3., 7.28.A6., 7.28.A8., 7.28.A13., 7.28.A20., 7.28.A22. to 7.28.A29.:

a. Minimum public corridor width shall be 5 feet (1.52 meters). Corridors used for patient entry, egress, and for surgical care areas in a facility shall have a minimum width of 6 feet (1.83 meters).

b. Each building shall have at least two exits that are remote from each other. Other details relating to exits and fire safety shall comply with NFPA 101 and the standards outlined herein.

c. Handwashing facilities shall be consistent with the requirements of Section 2.1.A.

9.2.H2. Finishes shall be consistent with the requirements of Section 7.28.B.

9.2.I. Design and Construction, Including Fire-Resistive Standards (Not Used)

*9.2.I1. (Not Used)

*9.2.I2. (Not Used)

*9.2.I3. (Not Used)

***9.2.J. Provision for Disasters** (Not Used)

9.3. Primary Care Outpatient Centers (Not Used)

9.4. Small Primary (Neighborhood) Outpatient Facility (Not Used)

9.5. Outpatient Surgical Facility

In addition to the requirements of Section 9.2., the following shall be provided.

9.5.A. General

Outpatient surgery is performed without anticipation of overnight patient care. The operational narrative shall describe in detail staffing, patient types, hours of operation, function and space relationships, transfer provisions, and availability of off-site services.

Procedures performed on persons who are known or suspected of having airborne infectious disease shall be performed in a room meeting airborne infection isolation ventilation requirements or in a space using local exhaust ventilation, in accordance with the "CDC Guidelines for Preventing the Transmission of Mycobacterium Tuburculosis in Health Care Facilities."

Visual and audible privacy shall be provided by design and include the registration, preparation, examination, treatment, and recovery areas.

9.5.B. Size (Not Used)

9.5.C. Parking

Parking shall be provided consistent with Section 9.1.G. In the absence of a formal parking study, four spaces for each room routinely used for surgical procedures, plus one space for each staff member shall be provided. Additional parking spaces convenient to the entrance for pickup of patients after recovery shall be provided.

9.5.D. Administration and Public Areas

The following shall be provided:

9.5.D1. A covered entrance for pickup of patients after surgery

9.5.D2. (Not Used)

9.5.D3. (Not Used)

9.5.D4. (Not Used)

9.5.D5. (Not Used)

9.5.D6. A medical records room equipped for dictating, recording, and retrieval

9.5.D7. (Not Used)

9.5.D8. (Not Used)

9.5.E. Sterilizing Facilities

A system for sterilizing equipment and supplies shall be provided consistent with the requirements of Section 7.21.A.

9.5.E1. Soiled Workroom (Not Used)

9.5.E2. Clean Assembly/Workroom (Not Used)

9.5.E3. Clean/Sterile Supplies (Not Used)

9.5.F. Clinical Facilities

Provisions shall be made to separate pediatric from adult patients. This shall include pre- and post-operative care areas and shall allow for parental presence.

9.5.F1. At least one room shall be provided for examination and testing of patients prior to surgery, assuring both visual and audible privacy. This may be an examination room or treatment room as described in Sections 9.2.B1. and 3.

9.5.F2. Each operating room shall have a minimum clear area of 360 square feet (33.45 square meters), exclusive of cabinets and shelves, but may be larger to accommodate the operational narrative which requires additional staff and/or equipment. Where justified by the operational narrative, the room may be reduced to a minimum clear area of 200 square feet (15 square meters). Rooms that will be dedicated to laser procedure shall have a minimum clear area of 400 square feet (37.16 square meters), exclusive of cabinets and shelves. An emergency communication system connected with the surgical suite control station shall be provided. There shall be at least one X-ray film illuminator in each room.

9.5.F3. Room(s) for recovery of outpatient surgical patients shall be provided consistent with the requirements of Sections 7.7.C14. and 2.1.C. Recovery areas shall be provided in sufficient number to accommodate the patient load. At least one stretcher station shall be provided.

9.5.F4. (Not Used)

9.5.F5. The services listed in Section 7.7.C. shall be provided.

9.5.G. Diagnostic Facilities

Diagnostic services shall be provided on- or off-site for preadmission tests, as required by the operational narrative.

9.5.H. Details and Finishes

All details and finishes shall meet the standards in Section 9.2.H. and below.

9.5.H1. Details shall conform to the following guidelines:

a. (Not Used)

b. (Not Used)

c. Toilet rooms shall be consistent with the requirements of Section 7.28.A4.

d. Flammable anesthetics shall not be used in outpatient surgical facilities.

9.5.H2. Finishes shall conform to the following guidelines:

a. Walls shall be consistent with the requirements of Section 7.28.B6.

b. Ceilings shall be consistent with the requirements of Section 7.28.B8.

9.6. Freestanding Emergency Facility (Not Used)

***9.7. Freestanding Birthing Center** (Not Used)

***9.8. Freestanding Outpatient Diagnostic and Treatment Facility** (Not Used)

***9.9. Endoscopy Suite**

All standards set forth in Sections 9.31. and 9.32. shall be met for new construction of endoscopy suites with modifications described in Section 9.9.

Procedures performed on persons who are known or suspected of having airborne infectious disease shall be performed in a room meeting airborne infection isolation ventilation requirements or in a space using local exhaust ventilation, in accordance with the "CDC Guidelines for Preventing the Transmission of Mycobacterium Tuburculosis in Health Care Facilities."

9.9.A. Procedure Room(s)

*9.9.A1. Each procedure room shall have a minimum clear area of 200 square feet (15 square meters) exclusive of fixed cabinets and built-in shelves.

9.9.A2. A handwashing fixture consistent with the requirements of Section 2.1.A. shall be provided in each procedure room.

9.9.A3. Provide station outlets for oxygen and vacuum (suction). See Table 5, Section 7.7.A4.

9.9.A4. Floor covering and perimeter bases shall be monolithic and joint-free.

9.9.A5. A system for staff emergency communication shall be provided consistent with the requirements of Section 7.32.G4.

9.9.A6. Procedure rooms shall be designed for visual and audible privacy for the patient consistent with the requirements of Section 9.1.H.

9.9.B. Instrument Processing Room(s)

*9.9.B1. Dedicated processing room(s) for cleaning and disinfecting instrumentation shall be provided.

9.9.B2. The decontamination room shall meet the following requirements:

a. Two utility sinks shall be provided remote from each other.

b. A free-standing handwashing fixture shall be provided consistent with the requirements of Section 2.1.A.

c. Work counter space(s)

d. Space for automatic endoscope cleaners, sonic processor, and flash sterilizers (where required).

e. Ventilation system. Negative pressure with a minimum of 10 air changes per hour shall be maintained. All air shall be exhausted to the outside to avoid recirculation within the facility.

f. Outlets for vacuum and compressed air shall be provided.

g. Floor covering and perimeter bases shall be monolithic and joint-free.

9.9.C. Patient Holding/Prep/Recovery Area

A patient holding/preparation/recovery area shall be provided consistent with the requirements of Section 2.1.C.

9.10. Cough-Inducing and Aerosol-Generating Procedures

All cough-inducing procedures performed on patients who may have infectious Mycobacterium tuberculosis shall be performed in booths or special enclosures with discharge HEPA filters or exhaust directly to the outside. These procedures may also be performed in a room that meets the ventilation requirements for airborne infection isolation. See Table 2A for ventilation requirements.

9.11. Reserved

9.12. Reserved

9.13. Reserved

9.14. Reserved

9.15. Reserved

9.16. Reserved

9.17. Reserved

9.18. Reserved

9.19. Reserved

9.20. Reserved

9.21. Reserved

9.22. Reserved

9.23. Reserved

9.24. Reserved

9.25. Reserved

9.26. Reserved

9.27. Reserved

9.28. Reserved

9.29. Reserved

9.30. Special Systems

9.30.A. General (Not Used)

9.30.B. Elevators

9.30.B1. All outpatient facilities having critical services (such as operating, diagnostic, or therapeutic) located on other than the grade-level entrance floor shall have electric or hydraulic elevators.

a. At least one elevator car shall have inside dimensions that accommodate a patient stretcher with attendants and be at least 5 feet 8 inches (1.73 meters) wide by 9 feet (2.74 meters) deep. Car doors shall have a clear opening of not less than 4 feet (1.22 meters) wide and 7 feet (2.13 meters) high.

Note: Additional elevators installed for visitors and material handling may be smaller than noted above, within restrictions set by standards for disabled access.

b. Elevators shall be equipped with a two-way automatic level-maintaining device with an accuracy of ±1/2 inch (±1.27 cm).

c. Elevator call buttons and controls shall not be activated by heat or smoke. Light beams, if used for operating door reopening devices without touch, shall be used in combination with door-edge safety devices and shall be interconnected with a system of smoke detectors.

d. Elevator controls, alarm buttons, and telephones shall be accessible to wheelchair occupants and usable by the blind.

9.30.B2. Field inspections and tests shall be made and the owner shall be furnished with written certification stating that the installation meets the requirements set forth in this Section, as well as all applicable safety regulations and codes.

9.30.C. Waste Processing Services

Provisions for waste disposal shall be consistent with the requirements of Section 7.30.C.

9.31. Mechanical Standards

9.31.A. General

Mechanical systems shall be consistent with the requirements of Sections 7.31.A. and 7.31.B.

9.31.B. Thermal and Acoustical Insulation (Not Used)

9.31.C. Steam and Hot Water Systems

9.31.C1. Boilers shall have the capacity, based upon the net ratings published by the Hydronics Institute or another acceptable national standard, to supply the normal heating, hot water, and steam requirements of all systems and equipment. Their number and arrangement shall accommodate facility needs, despite the breakdown or routine maintenance of any one boiler.

9.31.D. Air Conditioning, Heating, and Ventilation Systems

Air Conditioning, Heating, and ventilation systems shall be installed consistent with the requirements of Section 7.31.D.

9.31.E. Plumbing and Other Piping Systems

Plumbing and other piping systems shall be installed consistent with the requirements of Section 7.31.E.

9.32. Electrical Standards

9.32.A. General

All electrical systems shall be installed consistent with the requirements of Section 7.32.A.

9.32.B. Services, Switchboards, Panelboards, and Transformers.

Services, switchboards, panelboards, and transformers shall be installed consistent with the requirements of Section 7.32.B.

9.32.C. Panelboards (Not Used)

9.32.D. Lighting

9.32.D1. Lighting shall meet or exceed the minimum illumination levels listed in Table 12.

9.32.D2. (Not Used)

9.32.D3. Approaches to buildings and parking lots and all occupied spaces shall have fixtures for lighting that can be illuminated as necessary.

9.32.D4. (Not Used)

9.32.D5. A portable or fixed examination light shall be provided for examination, treatment, and trauma rooms.

9.32.D6. Operating rooms shall have general lighting in addition to special lighting units provided at surgical tables. General lighting and special lighting shall be on separate circuits.

9.32.D7. Light fixtures shall be equipped with lenses or shields for protection of the lamps or with lamps which will not shatter.

9.32.E. Receptacles (Convenience Outlets)

Duplex grounded-type receptacles (convenience outlets) shall be installed in all areas in sufficient quantities for tasks to be performed consistent with the operational narrative and consistent with the requirements of Section 7.32.E. Each examination and work table shall have access to a minimum of two duplex receptacles.

9.32.F. Equipment (Not Used)

9.32.G. Nurse Call System

A nurse call system shall be provided consistent with the requirements of Sections 7.32.G2. and 7.32.G4.

9.32.H. Emergency Electrical Service

Emergency lighting and power shall be provided consistent with NFPA 99, NFPA 101, and NFPA 110.

9.32.I. Fire Alarm System (Not Used)

9.32.J. Telecommunications and Information Systems

Telecommunications and information systems shall be installed consistent with the requirements of Section 7.32.J.

10. REHABILITATION FACILITIES

*10.1. General Considerations

There shall be for each project an operational narrative for the facility consistent with Section 1.1.C. The design and construction of the project shall be consistent with the operational narrative.

The facility shall meet all the standards described herein. Deviations shall be described and justified in the operational narrative for specific approval by the MDCIS.

Parking facilities shall be consistent with the requirements of Section 7.1.D.

10.1.A. Functional Units and Service Areas

Functional units and service areas shall include:

10.1.A1. Required units. Each rehabilitation facility shall contain a medical evaluation unit and one or more of the following units:

a. Psychological services

b. Social services

c. Vocational services

10.1.A2. (Not Used)

10.2. Evaluation Unit

10.2.A. (Not Used)

10.2.B. Examination Room(s)

Examination rooms shall be consistent with the requirements of Section 2.1.H5., except that a minimum floor area of 140 square feet (13.01 square meters) shall be provided.

10.2.C. Evaluation Room(s)

Evaluation room areas shall be arranged to permit appropriate evaluation of patient needs and progress and to determine specific programs of rehabilitation. Rooms shall include a desk and work area for the evaluators; writing and workspace for patients, and storage for supplies. Where the facility is small and workload light, evaluation may be done in the examination room(s).

10.2.D. Laboratory Facilities

Facilities shall be provided within the rehabilitation department or through contract arrangement with a nearby hospital or laboratory for services described in the operational narrative and consistent with the requirements of Section 7.12.

10.2.E. Imaging Facilities

Facilities shall be provided within the rehabilitation department for services described in the operational narrative and consistent with the requirements of Section 7.10.

10.3. Psychological Services Unit

This shall include office(s) and workspace for testing, evaluation, and counseling.

10.4. Social Services Unit

This shall include office space(s) for private interviewing and counseling.

10.5. Vocational Services Unit

Office(s) and workspace for vocational training, counseling, and placement shall be provided.

10.6. Dining, Recreation, and Day Spaces

The following standards shall be met for patient dining, recreation, and day spaces (areas may be in separate or adjoining spaces).

10.6.A. Inpatients and Residents

A total of 55 square feet (5.11 square meters) per bed.

10.6.B. Outpatients

If dining is part of the day care program, a total of 55 square feet (5.11 square meters) per person shall be provided. If dining is not part of the program, at least 35 square feet (3.25 square meters) per person shall be provided for recreation and day spaces.

10.6.C. Storage

Overall storage requirements for the facility shall be consistent with the requirements of Section 7.22. Additional storage spaces shall be provided for recreational equipment and supplies.

10.7. Dietary Department

Dietary facilities shall be provided consistent with the requirements of Section 7.18.

10.8. Personal Care Unit for Inpatients

A separate room, with appropriate fixtures and utilities, or facilities within each inpatient room, shall be provided for patient grooming.

10.9. Activities for Daily Living Unit

A unit for teaching daily living activities shall be provided. It shall include a bedroom, bath, kitchen, and space for training stairs. Equipment shall be functional. The bathroom must be in addition to other toilet and bathing requirements. The facilities shall be similar to a residential environment so that the patient may learn to use them at home.

10.10. Administration and Public Areas

Facilities shall be provided consistent with the requirements of Section 7.19.

10.11. Engineering Service and Equipment Areas

Facilities shall be provided consistent with the requirements of Section 7.27.

10.12. Linen Services

Facilities shall be provided consistent with the requirements of Section 7.23.

10.13. Housekeeping Room(s)

Facilities shall be provided consistent with the requirements of Section 7.26.

10.14. Employee Facilities

In addition to the employee facilities such as locker rooms, lounges, toilets, or showers called for in certain departments, a sufficient number of such facilities to accommodate the needs of all personnel and volunteers assigned to 1st and 2nd shifts shall be provided.

10.15. Nursing Unit (for Inpatients)

Where inpatients are a part of the facility, each nursing unit shall provide the following.

10.15.A. Patient Rooms

Each patient room shall meet the following requirements.

10.15.A1. Maximum room occupancy shall be consistent with the requirements of Section 7.2.A1.

10.15.A2. Minimum room areas shall be consistent with the requirements of Section 7.2.A2., except that 140 square feet (13.01 square meters) of clear floor space shall be provided in single-bed rooms and 125 square feet (11.61 square meters) per bed in multi-bed rooms.

10.15.A3. Each patient sleeping room shall have a window consistent with Section 7.28.A10.

10.15.A4. (Not Used)

10.15.A5. (Not Used)

10.15.A6. Toilet facilities which meet barrier-free design criteria shall be provided consistent with the requirements of Section 7.2.A5.

10.15.A7. Each patient shall have a wardrobe, closet, or locker with minimum clear dimensions of 1 foot 10 inches (55.88 cm) by 1 foot 8 inches (50.80 cm). An adjustable clothes rod and adjustable shelf shall be provided.

10.15.A8. Visual privacy shall be provided for each patient in multi-bed rooms consistent with the requirements of Section 7.2.A7.

10.15.B. Service Areas

Facilities shall be provided consistent with the requirements of Section 2.1.H., except that:

a. Clear floor space for examination/treatment rooms shall comply with Section 10.2.B.

b. Day/dining spaces shall be provided on the unit that comply with Section 10.6.

10.15.C. Patient Bathing Facilities

Bathtubs or showers shall be provided at a ratio of one bathing facility for each eight beds not otherwise served by bathing facilities within patient rooms. At least one island-type bathtub shall be provided in each nursing unit. Each tub or shower shall be in an individual room or privacy enclosure that provides space for the private use of bathing fixtures, for drying and dressing, and for a wheelchair and an assistant. Showers in central bathing facilities shall be at least 4 feet (1.22 meters) square, curb-free, and designed for use by a wheelchair patient. Central bathing facilities shall have access to handwashing and toilet facilities without entering the corridor.

10.15.D. Patient Toilet Facilities (Not Used)

10.15.E. Airborne Infection Isolation Room(s)

The need for and number of required airborne infection isolation rooms in the rehabilitation facility shall be determined by an infection control risk assessment. When required, the airborne infection isolation room(s) shall comply with the general requirements of Section 7.2.C. These may be located within individual nursing units and used for normal acute care when not required for isolation cases, or they may be grouped as a separate isolation unit.

10.16. Sterilizing Facilities

Where required by the operational narrative, a system for sterilizing equipment and supplies shall be provided.

10.17. Physical Therapy Unit

Facilities shall be consistent with the requirements of Section 7.13.C.

10.18. Occupational Therapy Unit

The following elements shall be provided (or shared with physical therapy facilities consistent with the operational narrative and as appropriate):

10.18.A. Office Space

10.18.B. Waiting Space

10.18.C. Activity Areas

10.18.D. Storage for Supplies and Equipment

10.18.E. (Not Used)

10.19. Prosthetics and Orthotics Unit

Facilities shall be provided consistent with the requirements of Section 7.13.E.

10.20. Speech and Hearing Unit

This shall include:

10.20.A. Office(s) for Therapists

10.20.B. Space for Evaluation and Treatment

10.20.C. Space for Equipment and Storage

10.21. Dental Unit

The following elements shall be provided:

10.21.A. Operatory

10.21.B. Laboratory and Film Processing Facilities

10.22. Imaging Suite. When required by the operational narrative, facilities shall be provided consistent with the requirements of Section 7.10.

10.23. Pharmacy Unit

Facilities shall be provided consistent with the requirements of Section 7.17.

***10.24. Details and Finishes**

All details and finishes for renovation projects as well as for new construction shall comply with the following requirements insofar as they affect patient services:

10.24.A. Facilities shall be consistent with the requirements of Section 7.28.A., as well as the following:

10.24.A1. (Not Used)

10.24.A2. (Not Used)

10.24.A3. (Not Used)

10.24.A4. Where the operational narrative states that the sleeping facility will be for residential use (and therefore not subject to in-bed patient transport), patient room doors may be 3 feet (0.91 meter) wide, if approved by the local authority having jurisdiction.

10.24.A5. Doors between corridors and rooms or those leading into spaces subject to occupancy, except elevator doors, shall be swing-type. Openings to showers, baths, patient toilets, and other small, wet-type areas not subject to fire hazard are exempt from this requirement.

10.24.A6. (Not Used)

10.24.A7. (Not Used)

10.24.A8. (Not Used)

10.24.A9. Patient rooms intended for 24-hour occupancy shall have windows that operate without the use of tools and shall have sills not more than 3 feet (0.9 meter) above the floor.

10.24.A10. (Not Used)

10.24.A11. (Not Used)

10.24.A12. (Not Used)

10.24.A13. Special consideration shall be given to shower curtain rods, which may be momentarily used for support.

10.24.A14. Recessed soap dishes shall be provided in showers and bathrooms.

10.24.A15. Handrails shall be provided on both sides of corridors used by patients. A clear distance of 1-1/2 inches (3.81 cm) shall be provided between the handrail and the wall, and the top of the rail shall be about 32 inches (81.28 cm) above the floor, except for special care areas, such as those serving children.

10.24.A16. Ends of handrails and grab bars shall be constructed to prevent snagging the clothes of patients. Handrails shall be finished to minimize potential for personal injury.

10.24.B. Finishes

Finishes shall be consistent with the requirements of Section 7.28.B.

10.25. Design and Construction, Including Fire-Resistant Standards (Not Used)

10.26. Reserved

10.27. Reserved

10.28. Reserved

10.29. Reserved

10.30. Special Systems

10.30.A. (Not Used)

10.30.B. Elevators

Elevators shall be consistent with the requirements of Section 7.30.B.

10.30.C. Waste Processing Services

Provisions for waste disposal shall be consistent with the requirements of Section 7.30.C.

10.31. Mechanical Standards

10.31.A. General

Mechanical systems shall be consistent with the requirements of Section 7.31.

10.32. Electrical Standards

10.32.A. General

All electrical systems shall be consistent with the requirements of Section 7.32.

11. PSYCHIATRIC HOSPITAL

(Not Used)

12. MOBILE, TRANSPORTABLE, AND RELOCATABLE UNITS

12.1. General Considerations

There shall be for each project an operational narrative for the facility consistent with Section 1.1.C. The design and construction of the project shall be consistent with the operational narrative.

The facility shall meet all the standards described herein. Deviations shall be described and justified in the operational narrative for specific approval by the MDCIS.

Mobile, transportable, and relocatable units (herein called "units") shall be approved by the Bureaus of Health Systems and Construction Codes, as well as the Office of Fire Safety of the MDCIS. Cardiac catheterization units shall also be approved by the Radiological Safety Section of the Bureau of Health Systems of the MDCIS.

12.2. Definitions

12.2.A. Mobile Unit

Any pre-manufactured structure, trailer, or self-propelled unit, designed to be moved on a daily basis to provide facilities for imaging, lithotripsy, diagnostic cardiac catheterization, or other medical services.

12.2.B. Transportable Unit

Any pre-manufactured structure or trailer designed to provide for imaging, lithotripsy, diagnostic cardiac catheterization, or other medical services at the same location on an extended temporary basis.

12.2.C. Relocatable Unit

Any structure, not on wheels, built to be relocated at any time and provide medical services.

12.2.D. Host Facility

A Hospital, Freestanding Surgical Outpatient Facility, or other licensed healthcare facility at which the unit facilitates patient examination or treatment.

12.2.E. Support Facility

An addition to or renovated space within the host facility designed to accommodate functions associated with one or more units. Support facilities can include the dock, connecting corridor, service areas, patient locker rooms, patient preparation/recovery facilities, and waiting areas.

12.3. General Requirements

12.3.A. **Support facilities** shall have appropriately sized utilities, including emergency power, water, waste, telephone, and fire alarm connections to serve the unit(s).

12.3.B. **Patient access** to the unit shall not be through non-patient areas of the host facility, such as loading docks, office suites, or warehousing spaces.

12.3.C. **Patient access** to the unit shall be through a permanent enclosure so as to protect patients from inclement weather (precipitation and temperature extremes), vermin, and filth.

12.3.D. **Patient access** to the mobile or transportable unit(s) shall be by ramp or mechanical lift equipped with guardrails.

12.3.E. **Handwashing facilities** for the unit(s) and support facility shall be consistent with the requirements of Section 2.1.A.

12.3.F. **Crash cart and oxygen** shall be conveniently located to the unit and support facility.

12.4. Site Requirements

12.4.A. **Access** for the unit to arrive (turning radius of vehicles, slopes of the approach, etc.) shall be taken into consideration.

12.4.B. **Mobile support facilities** shall have level concrete pads for parking the unit(s) when in use.

12.5. Support Facility Requirements

12.5.A. Patient Holding Areas

Patient holding facilities shall be consistent with the requirements of Section 2.1.C. and be located convenient to the unit(s).

12.5.B. Patient Change Facilities

Patient dressing rooms shall be provided that are equipped with private dressing spaces that include a seat or bench, secured storage for patient belongings, and waiting areas designed to assure visual privacy. Toilet rooms shall be provided that are conveniently located to the dressing rooms.

12.5.C. Service Areas

Service areas shall be consistent with the requirements of Section 2.1.H. and be located convenient to the unit(s).

12.6. Magnetic Resonance Imaging Unit Requirements

12.6.A. An enclosure (such as a fence) with clearly visible warning signage shall be provided around Magnetic Resonance Imaging (MRI) units at or beyond the 5 gauss field-strength limit. Radio frequency interference with nearby vehicles, and individuals with electronic pacemaker implants shall be considered in site design.

12.6.B. Support facilities serving MRI unit(s) shall accommodate cryogen-servicing of the magnet.

12.6.C. Clearly visible warning signs shall be provided within the support facility at or beyond the 5 gauss field-strength limit.

12.6.D. Separate housekeeping closet or space within the housekeeping closet shall be conveniently provided for nonmagnetic cleaning equipment.

12.7. Cardiac Catheterization Unit Requirements

12.7.A. A scrub sink shall be provided within the unit.

12.7.B. A weather-tight dock seal shall be provided between the unit and the support facility.

12.8. General Standards for Details and Finishes

12.8.A. Support Facilities

Details and finishes for support facilities shall be consistent with the requirements of Section 7.28.

12.8.B. Mobile Units

12.8.B1. Details and finishes for mobile units shall be consistent with the requirements of Sections 7.28.A13., 7.28.A16. - 29., and 7.28.B.

12.8.B2. Doorway clear openings in mobile units shall accommodate transport of patient stretchers from the support facility to the procedure table.

12.8.B3. Clear floor spaces in mobile units shall accommodate routine transport of patient stretchers from the support facility to the procedure table, staff access on both sides and the foot of the procedure table.

12.8.B4. Radiation protection for X-ray and gamma ray installations shall be in accordance with Michigan's Ionizing Radiation Rules and NCRP Reports, Numbers 49 and 51.

12.8.C. Transportable and Relocatable Units

12.8.C1. Details and finishes for transportable and relocatable units shall be consistent with the requirements of Section 7.28.

12.8.C2. Radiation protection for X-ray and gamma ray installations shall be in accordance with Michigan's Ionizing Radiation Rules and NCRP reports numbers 49 and 51.

12.9. Reserved

12.10. Reserved

12.11. Reserved

12.12. Reserved

12.13. Reserved

12.14. Reserved

12.15. Reserved

12.16. Reserved

12.17. Reserved

12.18. Reserved

12.19. Reserved

12.20. Reserved

12.21. Reserved

12.22. Reserved

12.23. Reserved

12.24. Reserved

12.25. Reserved

12.26. Reserved

12.27. Reserved

12.28. Reserved

12.29. Reserved

12.30. Reserved

12.31. Mechanical Standards

12.31.A. Transportable Units, Relocatable Units, and Support Facilities

12.31.A1. These units and facilities shall be consistent with the mechanical requirements of the host facility (Section 7.31. for hospitals, Section 8.31. for nursing facilities, or Section 9.31. for outpatient facilities).

12.31.A2. These units and facilities shall be consistent with the electrical requirements of Section 7.32.

12.31.B. Mobile Units

12.31.B1. Units shall be consistent with the mechanical requirements of Sections 9.31.A., 9.31.B., 9.31.D., 7.31.E3.a., 7.31.E4.g., 7.31.E5., 7.31.E6., 7.31.E7., and 7.31.E9. HVAC filters for services, other than cardiac catheterization, need only comply with the standards for administrative areas (25 percent efficiency).

12.31.B2. Domestic air intakes in the unit, support facility, and host facility shall be located at least 25 feet (7.62 meters) from all plumbing vents, exhaust fans, and sources of combustion fumes, including the unit's emergency generator.

12.31.B3. Water and sanitary waste lines from the unit shall be provided with a means of freeze protection.

12.31.B4. Backflow prevention shall be installed at the point of water connection on the unit.

12.32. Electrical Standards

12.32.A. General

12.32.A1. All electrical material and equipment, including conductors, controls, and signaling devices shall be installed in compliance with applicable sections of NFPA 70 and NFPA 99 and shall be listed as complying with available standards of listing agencies or other similar established standards where such standards are required.

*12.32.A2. (Not Used)

*12.32.A3. (Not Used)

12.32.A4. On mobile units an external electrical disconnect switch shall be provided that is capable of being locked in the "on" and "off" positions. The plug connectors (power and communications) serving mobile units shall be located in an improved, well drained area.

12.32.B. Services and Switchboards

Switchboards, overload protective devices, and panelboards shall be consistent with the requirements of Section 7.32.B.

12.32.C. (Not Used)

12.32.D. Lighting

12.32.D1. Lighting shall be consistent with the requirements of Section 7.32.D.

12.32.D2. (Not Used)

12.32.D3. (Not Used)

12.32.D4. (Not Used)

12.32.D5. (Not Used)

12.32.D6. Light fixtures shall be equipped with lenses or shields for protection of the lamps or with lamps that will not shatter.

12.32.E. Receptacles (Convenience Outlets)

Duplex grounded-type receptacles (convenience outlets) shall be installed in all areas in sufficient quantities for tasks to be performed consistent with the requirements of Section 7.32.E. Each examination and work table shall have access to a minimum of two duplex receptacles.

12.32.F. Equipment (Not Used)

12.32.G. Reserved

12.32.H. Emergency Electrical Service

12.32.H1. Emergency lighting and power shall be provided consistent with NFPA 99, NFPA 101, and NFPA 110.

12.32.H2. Cardiac catheterization units shall be served by emergency power.

12.32.I. Fire Alarm System (Not Used)

12.32.J. Telecommunications and Information Systems

12.32.J1. Locations for terminating telecommunications and information system devices shall be located on the unit and support facility that the devices serve and shall be accessible to authorized personnel only.

12.32.J2. Special air conditioning and voltage regulation shall be provided when recommended by the manufacturer.

Table 12
Illumination of Health Care Facilities

The tabulation of lighting values refer to the lowest acceptable measured reading at a described location. The illuminance values were derived from the 1981 Illuminating Engineering Society Lighting Handbook Reference Volume.

AREA / ACTIVITY	ILLUMINANCE (Foot-candles)
Autopsy and Morgue	
Autopsy, general	75
Autopsy Table - unless supplemented by a variable light fixture	Task lighting as required
Morgue, general	30
Central Sterile Supply	
Work areas	50
Processed storage	30
Charting	50
Corridors	
Day	20
Night	10
Critical Care Areas (PICU, NICU, ICU)	
General (entire room)	20
Examination (local) Fixed	150
Day Room/Dining Room	30
Dialysis Unit	
General	30
Reprocessing	75
Dialysate room	30
Dietary	
General	30
Dish Washing	50
Tray Assembly	50
Food Storage	20

Table 12 (Continued)
Illumination of Health Care Facilities

Emergency Department	
General	50
Examination/Treatment (fixed)	150
Examination & Treatment Rooms	
General	50
Exam/Treatment	150 (may be portable)
Hand Wash Locations	30
Janitor Closet	20
Laboratories	
General - additional task lighting as required.	50
Laundry	
Preparation and Tubs	30
Washer and Dryer	30
Linens	
Sorting soiled linen	30
Central (clean) linen room	30
Sewing room, general	30
Sewing room, work area	75
Locker Rooms	20
Maintenance Department	30
Nurseries	
General	20
Exam/treatment	150 (may be portable)
Nursing Stations	
General	30
Desk	50
Medication Station	75
Nourishment Room	30

Table 12 (Continued)
Illumination of Health Care Facilities

Obstetric Delivery Suite	
Scrub, general	75
General	150
Delivery Table	Task lighting as required
Postdelivery recovery area	75
Substerilizing room	30
Occupational Therapy	
Work Area, general	30
Work tables or benches	75
Patient Holding Areas	75
Patient's/Resident Rooms	
General (entire room)	20
Observation-night lighting	3
Critical examination	75 (may be portable)
Reading location (reading lamp or overbed fixture)	30
LDR/LDRP	Task lighting as required
Pharmacy	
General (entire room)	75
Physical Therapy Departments	30
Imaging Suite	
Diagnostic Section	
General	20
Film sorting	20
Radiation Therapy Section	
General	20
Hot Lab.	75
Stairways	20
Storage Rooms	20

Table 12 (Continued)
Illumination of Health Care Facilities

Surgical Suite/Angiography/Cardiac Cath.	
Operating room, general	150
Operating table	Task lighting as required
Scrub general	75
Instruments and sterile supply room	30
Clean up room, instruments	50
Anesthesia storage	30
Substerile room	30
Toilets/Bathing	
General (Includes water closets, shower/tub)	30
Night Lighting	3
Utility Room (clean and soiled)	
General	30
Work Counter	50

APPENDIX A

This Appendix is not part of the requirements of these Guidelines, but is included for information purposes only.

The following notes, bearing the same number as the text of the Guidelines to which they apply, contain useful explanatory material and references.

A1.2.D. The following are examples of what is intended by Section 1.2.D.:

- If an existing hospital has 6 foot (1.83 meters) wide corridors, these corridors could not be reduced in width during renovations, even though the requirements for existing buildings do not require 6 foot (1.83 meters) wide corridors.

- If a hospital has 10 foot (3.05 meters) wide corridors, they may be reduced to 8 feet (2.44 meters) width, which is the requirement for new construction.

- If a hospital were to have a passageway that is only 3 feet (0.9 meter) wide, it would have to be increased to 4 feet (1.22 meters), which is the minimum requirement for existing buildings.

- If the hospital has an existing 7 foot (2.13 meters) wide corridor that is to be replaced during renovations, it would normally be required to be increased to 8 feet (2.44 meters). However, if the building's column spacing limits corridor width to 7 feet (2.13 meters), and there is no easy or practical way to achieve an 8 foot (2.44 meters) corridor width, the Department would judge if a 7 foot (2.13 meters) corridor is adequate.

A1.3. The Americans with Disabilities Act (ADA) became law in 1990. This law extends comprehensive civil rights protection to individuals with disabilities. Under Titles II and III of the ADA, public, private, and public service hospitals and other health care facilities will need to comply with the *Accessibility Guidelines for Buildings and Facilities* (ADAAG) for alterations and new construction. The Uniform Federal Accessibility Standards (UFAS), also provides criteria for the disabled. Implementation of UFAS and ADAAG for federal facilities is handled in the following ways:

Compliance with UFAS

Compliance with ADAAG

Compliance with a combination of UFAS and ADAAG using the most stringent criteria

Individual federal agencies will provide direction on applicable criteria to be used for the design of federal facilities.

Also available for use in providing quality design for the disabled is the American National Standards Institute (ANSI) A117.1 American National Standard for Accessible and Usable Buildings and Facilities.

State and local standards for accessibility and usability may be more stringent than ADA, UFAS, or ANSI A117.1. Designers and owners, therefore, must assume responsibility for verification of all applicable requirements.

A1.4. Owners of existing facilities should undertake an assessment of their facility with respect to its ability to withstand the effects of regional natural disasters. The assessment should consider performance of structural and critical nonstructural building systems, and the likelihood of loss of externally supplied power, gas, water, and communications under such conditions. Facility master planning should consider mitigation measures required to address conditions that may be hazardous to patients and conditions that may compromise the ability of the facility to fulfill its planned post-emergency medical response. Particular attention should be paid to seismic considerations in areas where the effective peak acceleration coefficient, Aa, of ASCE 7-93 exceeds 0.15.

A1.4.A. The ASCE 7-93 seismic provisions are based on the National Earthquake Hazards Reduction Program (NEHRP) provisions (1988 Edition) developed by the Building Seismic Safety Council (BSSC) for the Federal Emergency Management Agency (FEMA).

A study by the National Institute of Standards and Technology (NIST) found that the following seismic standards were essentially equivalent to the NEHRP (1988) provisions:

The 1991 ICBO Uniform Building Code
The 1992 Supplement to the BOCA National Building Code
The 1992 Amendments to the SBCC Standard Building Code

Executive Order 12699, dated January 5, 1990, specified the use of the maps in the most recent edition of ANSI A58 for seismic safety of Federal and Federally Assisted or Regulated New Building Construction. The ASCF 7 Standard was formerly the ANSI A58 Standard. Public Law 101-614 charged FEMA to ". . . prepare and disseminate widely . . . information on building codes and practices for buildings . . ." The NEHRP provisions were developed to provide this guidance.

A1.5.C. American National Standard/Association for Advancement of Medical Instrumentation. Hemodialysis Systems RD5-1992.

American National Standards Institute. Standard A17.1 (ANSI A17.1). American National Standard Safety Code for Elevators, and Escalators.

American Society of Civil Engineers. ASCE 7-93, formerly ANSI A58.1, Minimum Design Loads for Buildings and Other Structures.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE). 1993 Fundamentals Handbook.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers. Standard 52-92, (ASHRAE 52.1-92), Gravimetric and Dust Spot Procedures for Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers. Standard 55-92, (ASHRAE 55-92), Thermal Environmental Controls for Human Occupancy.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers. Standard 62-89, (ASHRAE 62-89), Ventilation for Acceptable Indoor Air Quality.

American Society of Heating, Refrigerating, and Air-Conditioning Engineers. 1995 Applications Handbook.

American Society of Mechanical Engineers. ASME A17.1. American National Standard Safety Code for Elevators and Escalators.

American Society of Mechanical Engineers. ASME A17.3. National Standard Safety Code for Existing Elevators and Escalators.

Americans with Disabilities Act.

Building Officials and Codes Administrators International, Inc. The BOCA Basic Building Code.

Building Officials and Codes Administrators International, Inc. The BOCA Basic Plumbing Code.

Building Officials and Codes Administrators International, Inc. The BOCA Basic Mechanical Code.

Centers for Disease Control and Prevention (CDC). "Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities." Morbidity and Mortality Weekly Review 1994:43 (No. RR-13).

Centers for Disease Control and Prevention (CDC). "Guidelines for Prevention of Nosocomial Pneumonia, 1994." American Journal of Infection Control (22:247-292).

Code of Federal Regulations. Title 10, Parts 20 and 35, Handling of Nuclear Materials.

Code of Federal Regulations. Title 29, Part 1910, Employee Safety and Health.

College of American Pathologists. Medical Laboratory Design Manual.

Compressed Gas Association (CGA). Standards for Medical-Surgical Vacuum Systems in Hospitals.

DOP Penetration Test Method. MIL STD no. 282, Filter Units, Protective Clothing, Gas-Masking Components and Related Products: Performance Test Methods.

General Services Administration, Department of Defense, Department of Housing and Urban Development, U.S. Postal Service. Uniform Federal Accessibility Standard (UFAS).

Health Education and Welfare. HEW publication no. (FDA)78-2081, (available through GPO), Food Service Sanitation Manual.

Hydronics Institute. Boiler Ratings: I-B-R, Cast Iron, and SBI Steel Boilers.

Illuminating Engineering Society of North America. Lighting Handbook. (Vol. 2, Applications).

Illuminating Engineering Society of North America. IESNA publication CP29, Lighting for Health Facilities.

Illuminating Engineering Society of North America. IESNA publication RP28, Lighting for Senior Housing.

International Conference of Building Officials (ICBO). Uniform Building Code.

National Association of Plumbing-Heating-Cooling Contractors (PHCC). National Standard Plumbing Code.

National Bureau of Standards Interagency Report. NBSIR 81-2195, Draft Seismic Standards for Federal Buildings Prepared by Interagency Committee on Seismic Safety in Construction (available from NTIS as No. PB81-163842).

National Council on Radiation Protection (NCRP). Medical X-ray and Gamma Ray Protection for Energies Up to 10 MeV Equipment Design and Use.

National Council on Radiation Protection (NCRP). Medical X-ray and Gamma Ray Protection for Energies up to 10 MeV Structural Shielding Design and Evaluation.

National Council on Radiation Protection (NCRP). Radiation Protection Design Guidelines for 0.1pi29100, MeV Particle Accelerator Facilities.

National Fire Protection Association. NFPA 20. Centrifugal Fire Pumps.

NFPA 70. National Electrical Code, as amended and promulgated by the Michigan Department of Consumer & Industry Services Bureau of Construction Codes, Electrical Division.

NFPA 72. Standard for the Installation, Maintenance, and Use of Protective Signaling Systems.

NFPA 80. Standard for Fire Doors and Windows.

NFPA 82. Standard on Incinerators, Waste and Linen Handling Systems and Equipment.

NFPA 90A. Standard for the Installation of Air Conditioning and Ventilating Systems.

NFPA 96. Standard for the Installation of Equipment for the Removal of Smoke and Grease-Laden Vapors from Commercial Cooking Equipment.

NFPA 99. Standard for Health Care Facilities.

NFPA 101. Life Safety Code.

NFPA 110. Emergency and Standby Power Systems.

NFPA 253. Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

NFPA 255. Standard Method of Test of Surface Burning Characteristics of Building Materials.

NFPA 258. Standard Research Test Method for Determining the Smoke Generation of Solid Materials.

NFPA 701. Standard Method of Fire Tests for Flame-Resistant Textiles and Films.

NFPA 801. Recommended Fire Protection Practice for Facilities Handling Radioactive Materials.

Southern Building Code Congress International, Inc. Standard Building Code.

Underwriter's Laboratories, Inc. Publication no. 181.

U.S. EPA. Methodology for Assessing Health Risks Associated with Indirect Exposure to Combustor Emissions--International. EPA/600/6-90/003.

U.S. EPA. The Risk Assessment Guidelines of 1986. EPA/600/8-87/045.

A1.5.D. Availability of Codes and Standards

The codes and standards that are U.S. government publications can be ordered from the Superintendent of Documents, U.S. Government Printing Office (GPO), Washington, D.C. 20402.

Air Conditioning and Refrigeration Institute
1501 Wilson Boulevard
Arlington, VA. 22209

American National Standards Institute
1430 Broadway
New York, N.Y. 10018

American Society of Civil Engineers
345 East 47th Street
New York, N.Y. 10017

American Society of Heating, Refrigerating, and Air-Conditioning Engineers
1741 Tullie Circle, NE
Atlanta, GA. 30329

Architectural and Transportation Barriers Compliance Board (ATBCB)
Office of Technical Services
330 C Street, SW
Washington, D.C. 20202

American Society for Testing and Materials (ASTM)
1916 Race Street
Philadelphia, PA. 19103

Building Officials and Code Administrators, Inc.
4051 West Flossmoor Road
Country Club Hills, IL 60477

Compressed Gas Association
1235 Jefferson Davis Highway
Arlington, VA 22202

Hydronics Institute
35 Russo Place
Berkeley Heights, N.J. 07922

Illuminating Engineering Society of North America (IESNA)
IES Publication Sales
345 East 47th Street
New York, N.Y. 10017

International Conference of Building Officials
5360 South Workman Mill Road
Whittier, CA 90601

National Association of Plumbing-Heating-Cooling Contractors
Box 6808
180 South Washington Street
Falls Church, VA 22046

National Council on Radiation Protection and Measurement
7910 Woodmont Avenue, Suite 1016
Bethesda, MD 20814

National Fire Protection Association
1 Batterymarch Park
P.O. Box 9101
Quincy, MA 02269-9101

National Technical Information System (NTIS)
5285 Port Royal Road
Springfield, VA 22161

Naval Publications and Form Center
5801 Tabor Avenue
Philadelphia, PA 19120
(for DOP Penetration Test Method)

Southern Building Code Congress International, Inc.
900 Montclair Road
Birmingham, AL 35213

Underwriter's Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062

U.S. Department of Justice
Americans with Disabilities Act

Michigan Department of Consumer & Industry Services
Bureau of Construction Codes
(Barrier Free Design, Elevators, Plumbing and Electrical, Boilers and Mechanical)
2501 Woodlake Circle
Okemos, MI 48864
517-241-9309
Mailing Address: P.O. Box 30254
Lansing, MI 48909

Michigan Department of Consumer & Industry Services
Office of Fire Safety
7150 Harris Drive
Lansing, MI 48913
Mailing Address: P.O. Box 30700
Lansing, MI 48909-8200

A2.1.G. The multidisciplinary group performing the infection control risk assessment should involve at least the health system's epidemiology/infection control department, the infection control committee (or committee charged with development and review of the infection control policy) and administrators representing special program needs. The assessment is primarily based on the population served and the programs and services provided. The assessment is performed in the early conceptual design phase to protect patients and avoid disruption of essential patient services. The risk assessment should also consider communicable disease prevalence in the community, availability of support agencies and the health system needs for managing patients with communicable disease (e.g., TB, Varicella, infections with resistant organisms), patients who are severely immunosuppressed, (e.g., bone marrow transplant recipients) or both.

A2.1.H1. It may be combined with or include centers for reception and communication. The station should permit visual observation of all traffic into the unit.

A2.1.H20. Where corridor chart boxes are used, the following issues should be considered:

a. Switching for the light source at the chart box should be automatic when opening the writing surface.

b. When closed, the boxes cannot extend more than 4 inches into the corridor consistent with the requirements of the Michigan Barrier Free Code and CABO A117.1-1992 Section 4.4.1.

c. The boxes should be constructed with self-closing devices, as per the requirements of the Office of Fire Safety, MDCIS.

d. The facility should have policies and procedures in place to insure patient/resident rights to prevent unauthorized access to their medical records.

A3.1.B. Availability of Transportation

Facilities should be located so that they are convenient to public transportation, where available, unless acceptable alternate methods of transportation to public facilities and services are provided.

A4.1.B. Design should consider the placement of cables from portable equipment so that circulation and safety are maintained.

A4.3. Major Technical Equipment

Examples of major technical equipment are X-ray and other imaging equipment, radiation therapy equipment, lithotripters, audiometry testing chambers, laundry equipment, computers, and similar items.

A5.1. Partitions and enclosures around renovation areas should be solid in nature, securely attached, and sealed at the floor and structure above. Where life safety does not warrant special constructions, measures should be taken to control the transmission of dust and other airborne substances. One method for achieving this is by means of a separate ventilation/exhaust system for the construction area, thereby maintainingnegative air pressure in the construction area. This would require further documentation of locations of fresh air intakes and filters (where necessary), as well as the disconnection of existing air ducts, as required.

A5.2. Particular attention should be paid to areas requiring special ventilation, including surgical services, protective environment rooms, airborne infection isolation rooms, laboratories, autopsy rooms, and local exhaust systems for hazardous agents. These areas should be recognized as needing mechanical systems that comply with infection control and/or laboratory safety requirements.

A7.1.E. When the concept of swing beds is part of the operational narrative, care should be taken to include requirements for all intended categories. Facility design for swing beds often requires additional corridor doors and provisions for switching nurse call operations from one nurse station to another, depending on use.

A7.2.A2. These areas are recognized as minimums and do not prohibit the use of larger rooms, where required, for needs and functions. The acuity of care being provided should be the determining factor.

A7.2.A3. Windows are important for the psychological well-being of many patients, as well as for meeting fire safety code requirements. They are also essential for continued use of the area in the event of mechanical ventilation system failure.

A7.2.C. Airborne Infection Isolation Room(s)

***Note*:** The airborne infection isolation room requirements contained in these Guidelines for particular service areas throughout a facility should be predicated on an "infection control risk assessment" and based on the needs of specific community and patient populations served by an individual organization. The number of airborne infection isolation rooms for individual patient units should be determined based upon an "infection control risk assessment" or by a multidisciplinary group designated for that purpose. This process ensures a more accurate determination of environmentally safe and appropriate room types and spatial needs. It is suggested that reference be made to the Center for Disease Control and Prevention (CDC) "Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities" as they appear in the Federal Register dated October 28, 1994 and the Morbidity and Mortality Weekly Report (MMWR) 1994; 43 (No. RR-13), and the "Guidelines for Prevention of Nosocomial Pneumonia, 1994," published by CDC in the American Journal of Infection Control (22:247-292).

A7.2.D. Protective Environment Room(s)

Immunosuppressed Host Airborne Infection Isolation (Protective Environment/Airborne Infection Isolation). An anteroom is required for the special case in which an immunosuppressed patient requires airborne infection isolation. There is no prescribed method for anteroom ventilation--the room can be ventilated with either of the following airflow patterns:

(a) air flows from the anteroom, to the patient room and the corridor, or

(b) air flows from the patient room and the corridor, into the anteroom.

The advantage of pattern (a) is the provision for a clean anteroom in which health care workers need not mask before entering the anteroom.

***Note*:** The differentiating factor between protective environment rooms and other patient rooms is the requirement for positive air pressure relative to adjoining spaces with all supply air passing through HEPA filters with 99.97 percent efficiency for particles >3 micron (µm) in size. When determined by an infection control risk assessment, special design considerations and air ventilation to ensure the protection of patients with these conditions should be required. The appropriate numbers and location of protective environment rooms should be concluded by the infection control risk assessment. Protective environment room(s) should contain only one bed and comply with Section 7.2.C. Special ventilation requirements are found in Table 2. Also, see special guidelines for protective environment rooms during renovation and construction in Section 5.1.

As designated by the operational narrative, both airborne infection isolation and protective environment rooms may be required. Many facilities care for patients with an extreme susceptibility to infection, e.g., immunosuppressed patients with prolonged granulocytopenia, most notably bone marrow recipients, or solid-organ transplant recipients and patients with hematological malignancies who are receiving chemotherapy and are severely granulocytopenic. These rooms are not intended for use with patients diagnosed with HIV infection or AIDS, unless they are also severely granulocytopenic. Generally, protective environments are not needed in community hospitals, unless these facilities take care of these types of patients. The appropriate clinical staff should be consulted regarding room type and spatial needs to meet facility infection control requirements. These requirements should be incorporated in design programming.

A7.3.A2. Transportation of patients to and from the critical care unit should ideally be separated from public corridors and visitor waiting areas.

A7.3.A3. In critical care units, the size of the patient care space should be dependent upon the intended functional use. The patient space in critical care units, especially those caring for surgical patients following major trauma or cardiovascular, transplant or orthopedic procedures, or medical patients simultaneously requiring ventilation, dialysis, and/or other large equipment (e.g., intra-aortic balloon pump) may be overwhelmed, if designed to the absolute minimum clear floor area.

A staff emergency assistance system should be provided on the most accessible side of the bed. The system should annunciate at the nurse station with backup from another staffed area from which assistance can be summoned.

Provision should be made for rapid and easily accessible information exchange and communication within the unit and the hospital.

The unit should provide the ability to continuously monitor the physiological parameters appropriate for the types of patients for which the unit is expected to provide care.

A7.3.A9. To minimize distraction of those preparing medications, the area should be enclosed. A glass wall or walls may be advisable to permit visualization of patients and unit activities. A self-contained medicine dispensing unit may be located at the nurses station, in the clean workroom, in an alcove, or in another area directly under visual control of nursing or pharmacy staff.

The recording, storage of bedside records (flowsheets, etc.), and review of clinical information is a vital function of a critical care unit. Space near the bedside for these functions should be provided. Suitable space ergonomically designed is especially germane where computers are used for the clinical record.

Equipment storage room. Appropriate room(s) should be provided for storage of large items of equipment necessary for patient care and as required by the functional program. Its location should not interfere with the flow of traffic. Work areas and storage of critical care supplies should be in locations such that they are readily accessible to nursing and physician staff. Shelving, file cabinets, and drawers should be located so that they are readily accessible.

Separate areas need to be designed for the unit secretary and staff charting. Planning should consider the potential volume of staff (both medical and nursing) that could be present at any one time and translate that to adequate charting surfaces. The secretarial area should be accessible to all. However, the charting areas may be somewhat isolated to facilitate concentration. Storage for chart forms and supplies should be readily accessible. Space for computer terminals and printer and conduit for computer hook-up should be provided when automated information systems are in use or planned for the future. Patient records should be readily accessible to clerical, nursing, and physician staff. Alcoves should be provided for the storage and rapid retrieval of crash carts and portable monitor/defibrillator units. Grounded electrical outlets should be provided in sufficient numbers to permit recharging stored battery-operated equipment.

A7.3.A11. Patients should be visually observed at all times. This can be achieved in a variety of ways. If a central station is chosen, it should be geographically located to allow for complete visual control of all patient beds in the critical care unit. It should be designed to maximize efficiency in traffic patterns. Patients should be oriented so that they can see the nurse but cannot see the other patients. There should be an ability to communicate with the clerical staff without having to enter the central station. If a central station is not chosen, the unit should be designed to provide visual contact between patient beds so that there can be constant visual contact between the nurse and patient.

A7.3.E6. General lighting in the nursery should not exceed 100 foot-candles measured at mattress level. The lighting fixture layout should be designed to avoid a fixture directly above or over the neonate. Whenever possible, general lighting, as well as supplemental examination lights, should be designed to be controlled from each incubator position. A master switch is also desirable to simultaneously control all lights in special situations.

Ambient lighting levels in newborn intensive care units should be adjustable through a range of at least 10 to 600 lux (approximately 1 to 60 foot-candles), as measured at each bedside. Both natural and artificial light sources should have controls that allow immediate darkening of any bed position sufficient for transillumination, when necessary.

Artificial light sources should have a visible spectral distribution similar to that of daylight, but should avoid unnecessary ultraviolet or infrared radiation by the use of appropriate lamps, lenses, or filters.

Separate procedure lighting should be available to each patient care station that provides no more than 1500 to 2000 lux (150 to 200 foot-candles) of illumination of the patient bed. This lighting should minimize shadow and glare; it should be adjustable and highly framed so babies at adjacent bed positions will not experience an increase in illumination.

At least one source of natural light should be visible from patient care areas. External windows in patient care rooms should be glazed with appropriate materials to minimize heat gain or loss, and should be situated at least 2 feet away from any part of a patient bed to minimize radiant heat loss from the baby. All external windows should be equipped with shading devices.

A7.3.E12. At least one transition room should be provided within or immediately adjacent to the NICU that allows parents and infants extended private time together. This room should have direct, private access to sink and toilet facilities, a bed for parents, communication linkage with NICU staff, and appropriate electric and medical gas outlets. The room(s) can be used for other family educational, counseling, parent sleeping, or demonstration purposes when not needed as a transition room.

A7.3.E14. There should be a breastfeeding/pumping room readily available for mothers of NICU babies to pump breastmilk.

A7.3.E15. Whenever possible, supplies should flow through special supply entrances from external corridors so that penetration of the semisterile zone by non-nursery personnel is unnecessary. Soiled materials should be sealed and stored in a soiled holding area until removed. This holding area should be located where there will be no need to pass back through the semi-sterile zone to remove the soiled materials.

A7.4.B. When facilities use a rooming-in program in which all infants are returned to the nursery at night, a reduction in nursery size may not be practical.

A7.4.D. When the operational narrative includes a mother-baby couplet approach to nursing care, the workroom functions described above may be incorporated in the nurse station that serves the postpartum patient rooms.

A7.5. Recognizing their unique physical and developmental needs, pediatric and adolescent patients, to the extent their condition permits, should be grouped together in distinct units or distinct areas of general units separate from adults.

A7.6. The environment of the unit should be characterized by a feeling of openness with emphasis on natural light and exterior views. Various functions should be accessible from common areas while not compromising desirable levels of patient privacy. Interior finishes, lighting, and furnishings should suggest a residential rather than an institutional setting. These should, however, conform with applicable fire safety codes. Security and safety devices should not be presented in a manner to attract or challenge tampering by patients.

Windows or vents in psychiatric units shall be arranged and located so that they can be opened from the inside to permit venting of combustion products and to permit any occupant direct access to fresh air in emergencies. The operation of operable windows shall be restricted to inhibit possible escape or suicide. Where windows or vents require the use of tools or keys for operation, the tools or keys shall be located on the same floor in a prominent location accessible to staff. Windows in existing buildings designed with approved, engineered smoke control systems may be of fixed construction. Where glass fragments pose a hazard to certain patients, safety glazing and/or other appropriate security features shall be used.

A7.6.B6. A viewing window to permit observation of patient areas by the charting nurse or physician may be used if the arrangement is such that patient files cannot be read from outside the charting space.

A7.7.A1. Where renovation work is undertaken, every effort shall be made to meet the minimum standards. If it is not possible to meet the square-foot standards, the MDCIS may grant approval to deviate from this requirement. In such cases, each room shall have a minimum clear area of 360 square feet (33.45 square meters), exclusive of fixed or wall-mounted cabinets and built-in shelves, with a minimum of 18 feet (5.49 meters) clear dimension exclusive of fixed cabinets and built-in shelves.

A7.7.A2. Where renovation work is undertaken, every effort shall be made to meet the minimum standards. If it is not possible to meet the square-foot standards, the MDCIS may grant approval to deviate from this requirement. In such cases, orthopedic surgical rooms may have a minimum clear area of 360 square feet (33.5 square meters) and a minimum dimension of 18 feet (5 meters). Rooms for cardiovascular, neurological, and other special procedures may have a minimum clear area of 400 square feet (44.39 square meters).

A7.7.A4. In renovation projects, rooms for surgical cystoscopy may have a minimum clear area of 250 square feet (23.28 square meters).

A7.7.B2. Separate and additional recovery space may be necessary to accommodate outpatients. If children receive care, recovery space should be provided for pediatric patients and the layout of the surgical suite should facilitate the presence of parents in the PACU.

A7.7.C5. In new construction, view windows at scrub stations permitting observation of room interiors should be provided.

A7.7.C7. An operating room suite design with a clean core must provide for no cross traffic of staff and supplies from the decontaminated/soiled areas to the clean areas. The use of facilities outside the operating room for soiled/decontaminated processing and clean assembly and sterile processing will be designed to move the flow of goods and personnel from dirty to clean without compromising universal (standard) precautions or aseptic techniques in both departments.

A7.8. Obstetrical program models vary widely in their delivery methodologies. The models are essentially three types. The following narrative describes the organizational framework of each model.

The Traditional Model

Under the traditional model, labor, delivery, recovery, and postpartum occur in separate areas. The birthing woman is treated as the moving part. She is moved through these functional areas depending on the status of the birth process.

The functional areas are separate rooms consisting of the labor room, delivery room, recovery room, postpartum bedroom, and infant nurseries (levels determined by acuity).

The Labor-Delivery-Recovery Model

All labor-delivery-recovery rooms (LDRs) are designed to accommodate the birthing process from labor through delivery and recovery of mother and baby. They are equipped to handle most complications, with the exception of caesarean sections.

The birthing woman moves only as a postpartum patient to her bedroom or to a caesarean section delivery room (surgical operative room), if delivery complications occur.

After the mother and baby are recovered in the LDR, they are transferred to a mother-baby care unit for postpartum stay.

The Labor-Delivery-Recovery-Postpartum Model

Single room maternity care in labor-delivery-recovery-postpartum rooms (LDRPs) adds a "P" to the LDR model. Room design and capability to handle most emergencies remain the same as the LDRs. However, the LDRP model eliminates a move to postpartum after delivery. LDRP uses one private room for labor, delivery, recovery, and postpartum stay.

Equipment is moved into the room as needed, rather than moving the patient to the equipped room. Certain deliveries are handled in a caesarean section delivery room (surgical operative room) should delivery complications occur.

A7.8.A2. Where renovation work is undertaken, every effort shall be made to meet the minimum standards. If it is not possible to meet the square-foot standards, the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, existing postpartum patient rooms shall have no less than 80 square feet (7.43 square meters) of clear floor area per bed in multiple-bed rooms and 100 square feet (9.29 square meters) in single-bed rooms.

A7.8.A4. When renovation work is undertaken, every effort shall be made to meet the minimum standards. If it is not possible to meet the square-foot standards, the authorities having jurisdiction may grant approval to deviate from this requirement. In such cases, existing LDR and LDRP rooms may have a minimum clear area of 200 square feet (18.58 square meters).

A7.9.A. Classification of emergency departments/services (from the Accreditation Manual for Hospitals. The Joint Commission on Accreditation of Healthcare Organizations, 1991, pp. 32-33):

> Level I: provides comprehensive emergency care 24 hours a day, with a physician experienced in emergency care on duty at all times. Must include in-hospital physician coverage of medical, surgical, orthopedic, obstetric/ gynecologic, pediatric, and anesthesia services. Other specialty coverage must be available within approximately 30 minutes. Physical and related emotional problems must be provided in-house.
>
> Level II: provides emergency care 24 hours a day, with a physician experienced in emergency care on duty at all times, and specialty consultation available within approximately 30 minutes. Physical and related emotional problems must be provided in-house, with transfer provisions to another facility, when needed.

Level III: provides emergency care 24 hours a day, with at least one physician available within approximately 30 minutes. Specialty consultation available per medical staff request or by transfer to a designated hospital where definitive care can be provided.

Level IV: provides reasonable care in assessing if an emergency exists and in performing lifesaving first aid, with appropriate referral to the nearest hospital capable of providing needed services. Physician coverage is defined by the local medical staff.

More detailed descriptions of emergency service categories may be available from the Committee on Trauma of the American College of Surgeons and the American College of Emergency Physicians.

A7.9.A1. Initial emergency management is care provided to stabilize a victim's condition and to minimize potential for further injury during transport to an appropriate service. Patients may be brought to the "nearest hospital," which may or may not have all required services for definitive emergency management. It is important that the hospital, in those cases, be able to assess and stabilize emergent illnesses and injuries and arrange for appropriate transfer.

A7.9.A2. Emergency care may range from the suturing of lacerations to full-scale emergency medical procedures. Facilities that include personnel and equipment for definitive emergency care shall provide for 24-hour service and complete emergency care leading to discharge to the patient's home or direct admission to the appropriate hospital.

A7.9.B. The extent and type of emergency service to be provided will depend upon community needs and the availability of other services within the area. While initial emergency management must be available at every hospital, full-scale definitive emergency services may be impractical and/or an unnecessary duplication. All services need adequate equipment and 24-hour staffing to ensure no delay in essential treatment. The following standards are intended only as minimums. Additional facilities, as needed, shall be as required to satisfy the operational narrative.

A7.9.C7. Airborne Infection Control

The need for airborne infection isolation rooms or protective environment rooms in a facility should be determined by an infection control risk assessment.
(See A7.2.C. for details.)

A7.9.D5. These measures may include enhanced general ventilation and air disinfection similar to inpatient requirements for airborne infection isolation rooms. See the "CDC Guidelines for Preventing the Transmission of Mycobacterium Tuberculosis in Health Care Facilities."

A7.9.D7. Treatment/examination rooms used for pelvic exams shall allow for the foot of the examination table to face away from the door.

A7.9.D8. Access needs to be convenient to the ambulance entrance.

In renovation projects, every effort shall be made to have existing cardiac/trauma rooms meet the above minimum standards. If it is not possible to meet the above standards, doorways leading from the ambulance entrance to the room may be 4 feet (1.22 meters) wide.

A7.9.D16. Disposal space for regulated medical waste, e.g., gauzes/linens soaked with body fluids, should be separate from routine disposal space.

A7.9.D21. A security station and/or system should be located to maximize visibility of the treatment areas, waiting areas, and key entrance sites. This system should include visual monitoring devices installed both internally in the emergency department, as well as externally at entrance sites and parking lots. Spatial requirements for a security station should include accommodation for hospital security staff, local police officers, and monitoring equipment. Design consideration should include installation of silent alarms, panic buttons, intercom systems, and physical barriers, such as doors to patient entry areas.

The security monitoring system should be included on the hospital's emergency power back-up system.

A7.9.D23. A family room to provide privacy for families of critically ill or deceased patients should be located away from the main traffic and treatment areas. An enclosed room with space for comfortable seating of six-to-ten persons should be provided; telephone access is essential. A salon- or parlor-type ambience and incandescent lighting is preferred.

A7.9.E. Other Space Considerations

When the operational narrative defines the need, there should be additional space considerations, as noted.

A7.9.E1. A decontamination room for both chemical and radiation exposure. This room should have a separate entrance to the emergency department, and an independent, closed drainage system. A negative airflow and ventilation system separate and distinct from the hospital system should be provided. Spatial requirements should allow for at least one stretcher, several hospital staff, two shower heads and an adjacent locked storage area for medical supplies and equipment. Solid lead-lined walls and doors should meet regulatory requirements.

A7.9.E2. A separate pediatric emergency area. This area should include space for registration, discharge, triage, waiting, and a playroom. An area for the nurse station and physician station, storage for supplies and medication, and one to two isolation rooms should also be included. Each examination/treatment room should be 100 square feet (9.29 square meters) of clear floor space, with a separate procedure/trauma room of 120 square feet (11.15 square meters) of clear floor space; each of these rooms should have handwashing facilities, vacuum, oxygen, and air outlets, examination lights, and wall/column mounted ophthalmoscopes/otoscopes. At least one room for pelvic examinations should be included. X-ray illuminators should be available.

A7.9.E3. Observation/holding units for patients requiring observation up to 23 hours or admission to an inpatient unit. This area should be located separately, but near the main emergency department. The size will depend upon the function (observation and/or holding), patient acuity mix, and projected utilization. As defined by the functional plan, this area should consist of a centralized nurse station, 100 square feet (9.29 square meters) of clear floor space for each cubicle, with vacuum, oxygen, and air outlets, monitoring space, and nurse call buttons. Patient toilet room(s) should be provided at a ratio of one for every eight treatment stations or fraction thereof. Storage space for medical and dietary supplies should be included. X-ray illuminators should be available.

A7.9.E4. A separate fast track area when annual emergency department visits exceed 20,000-30,000 visits should be considered. This area should include space for registration, discharge, triage, and waiting, as well as a physician/nurse work station. Storage areas for supplies and medication should be included. A separate treatment/ procedure room of 120 square feet (11.15 square meters) of clear floor space should be provided. Examination/treatment areas should be 100 square feet (9.29 square meters) of clear floor space, with handwashing facilities, vacuum, oxygen, air outlets, and examination lights. At least one treatment/examination room should be designated for pelvic examinations.

A7.9.E5. A patient hygiene room with shower and toilet facilities.

A7.10.A1. Radiography rooms should be a minimum of 180 square feet (7.43 square meters). (Dedicated chest X-ray may be smaller.)

Tomography and Radiography/Fluoroscopy (R & F) rooms should be a minimum of 250 square feet (23.23 square meters).

Mammography rooms should be a minimum of 100 square feet (9.29 square meters).

Minimum size should be 260 square feet (24.15 square meters) for the simulator room.

Minimum size, including the maze, should be 680 square feet (63.17 square meters) for accelerator rooms and 450 square feet (41.81 square meters) for cobalt rooms.

A7.10.A5. Some equipment may require additional air conditioning for the computer room.

A7.10.B15. When provided, space should be a minimum of 50 square feet (4.65 square meters) to accommodate two large dewars of cryogen.

A7.11. Nuclear Medicine

A7.11.A. Equipment and space should be provided as necessary to accommodate the operational narrative. Nuclear medicine may include positron emission tomography, which is not common to most facilities. It requires specialized planning for equipment.

A7.11.B. A certified physicist or other qualified expert representing the owner or state agency should specify the type, location, and amount of radiation protection to be installed in accordance with final approved department layout and equipment selection. These specifications should be incorporated into the plans.

A7.11.C. Flooring should meet load requirements for equipment, patients, and personnel. Floors and walls should be constructed of materials that are easily decontaminated in case of radioactive spills. Walls should contain necessary support systems for either built-in or mobile oxygen and vacuum, and vents for radioactive gases. Provision for wiring raceways, ducts or conduits should be made in floors, walls, and ceilings. Ceilings may be higher than 8'-0" (2.44 meters). Ceiling-mounted equipment should have properly designed rigid support structures located above the finished ceiling. A lay-in type ceiling should be considered for ease of service, installation, and remodeling.

A7.11.D. Space should be provided, as necessary, to accommodate the operational narrative. Where the operational narrative calls for it, the nuclear medicine room should accommodate the equipment, a stretcher, exercise equipment (treadmill and/or bicycle) and staff.

A7.11.E. If radiopharmaceutical preparation is performed on-site, an area adequate to house a radiopharmacy should be provided with appropriate shielding. This area should include adequate space for storage of radionuclides, chemicals for preparation, dose calibrators, and record keeping. Floors and walls should be constructed of easily decontaminated materials. Vents and traps for radioactive gases should be provided, if such are used. Hoods for pharmaceutical preparation should meet applicable standards. If pre-prepared materials are used, storage and calculation area may be considerably smaller than that for on-site preparation. Adequate space should be provided for dose calibration, quality assurance, and record keeping. The area may still require shielding from other portions of the facilities.

A7.11.F. Positron Emission Tomography (PET)

A7.11.F1. Space should be provided as necessary to accommodate the operational narrative. PET scanning is generally used in experimental settings and requires space for a scanner and for a cyclotron. The scanner room should be a minimum of 300 square feet (27 square meters).

A7.11.F2. Where a cyclotron room is required, it should be a minimum of 225 square feet (20.90 square meters) with a 16 square foot (4.88 square meters) space safe for storage of parts, which may need to cool down for a year or more.

A7.11.F3. Both a hot (radioactive) lab and a cold (nonradioactive) lab may be required, each a minimum of 250 square feet (23.23 square meters).

A7.11.F4. A blood lab of a minimum of 80 square feet (7.43 square meters) should be provided.

A7.11.F5. A patient holding area to accommodate two stretchers should be provided.

A7.11.F6. A gas storage area large enough to accommodate bottles of gas should be provided. Each gas will be piped individually and may go to the cyclotron or to the lab. Ventilation adequate for the occupancy is required. Compressed air may be required to pressurize a water circulation system.

A7.11.F7. Significant radiation protection may be required since the cyclotron may generate high radiation.

A7.11.F8. Special ventilation systems together with monitors, sensors, and alarm systems may be required to vent gases and chemicals.

A7.11.F9. The heating, ventilating, and air conditioning system will require particular attention; highest pressures should be in coldest (radiation) areas and exhaust should be in hottest (radiation) areas. Redundancy may be important.

A7.11.F10. The cyclotron is water cooled with de-ionized water. A heat exchanger and connection to a compressor or connection to chilled water may be required. A redundant plumbing system connected to a holding tank may be required to prevent accidental leakage of contaminated water into the regular plumbing system.

A7.11.G. Nuclear medicine area when operated separately from the imaging department should include the following.

A7.11.G1. Space should be adequate to permit entry of stretchers and beds, and to accommodate imaging equipment, electronic consoles and, if present, computer terminals.

A7.11.G2. A darkroom on-site should be available for film processing. The darkroom should contain protective storage facilities for unexposed film that guard the film against exposure or damage.

A7.11.G3. When the operational narrative requires a centralized computer area, it should be a separate room with access terminals available within the imaging rooms.

A7.11.G4. Provisions for cleanup should be located within the suite for convenient access and use. It should include service sink or floor receptacle, as well as storage space for equipment and supplies.

A7.11.G5. Film storage with cabinets or shelves for filing patient film for immediate retrieval should be provided.

A7.11.G6. Inactive film storage under the departmental administrative control and properly secured to protect film against loss or damage should be provided.

A7.11.G7. A consultation area with view boxes illuminated to provide light of the same color value and intensity for appropriate comparison of several adjacent films should be provided. Space should be provided for computer access and display terminals, if such are included in the program.

A7.11.G8. Offices for physicians and assistants should be provided and equipped for individual consultation, viewing, and charting of film.

A7.11.G9. Clerical offices and spaces should be provided as necessary for the program to function.

A7.11.G10. Waiting areas should be provided out of traffic, under staff control, and should have seating capacity consistent with the operational narrative . If the department is routinely used for outpatients and inpatients at the same time, separate waiting areas should be provided with screening or visual privacy between the waiting areas.

A7.11.G11. A dose administration area as specified by the operational narrative, should be provided and located near the preparation area. Since as much as several hours may elapse for the dose to take effect, the area should provide for visual privacy from other areas. Thought should be given to entertainment and reading materials.

A7.11.G12. A holding area for patients on stretchers or beds should be provided out of traffic and under control of staff and may be combined with the dose administration area with visual privacy between the areas.

A7.11.G13. Patient dressing rooms should be provided convenient to the waiting area and procedure rooms. Each dressing room should include a seat or bench, a mirror, and provisions for hanging patients' clothing and for securing valuables.

A7.11.G14. Toilet rooms should be provided convenient to waiting and procedure rooms.

A7.11.G15. Staff toilet rooms should be provided convenient to the nuclear medicine laboratory.

A7.11.G16. Handwashing facilities should be provided within each procedure room.

A7.11.G17. Control desk and reception area should be provided.

A7.11.G18. Clean linen storage area with a handwashing facility should be provided.

A7.11.G19. Provisions with handwashing facilities should be made for holding soiled material. Separate provisions should be made for holding contaminated material.

A7.12. Laboratory facilities should be provided for the performance of tests in hematology, clinical chemistry, urinalysis, microbiology, anatomic pathology, cytology, and blood banking to meet the workload described in the operational narrative. Certain procedures may be performed on-site or provided through a contractual arrangement with a laboratory service acceptable to the authority having local jurisdiction.

Provisions should be made for the following procedures to be performed on-site: blood counts, urinalysis, blood glucose, electrolytes, blood urea and nitrogen (BUN), coagulation, and transfusions (type and cross-match capability).

Provisions should also be included for specimen collection and processing.

A7.12.D. For example, separate facilities should be provided for such incompatible materials as acids and bases, and vented storage should be provided for volatile solvents. Such facilities should conform to applicable NFPA standards.

A7.12.G. Facilities and equipment for terminal sterilization of contaminated specimens should be provided consistent with the operational narrative and the Medical Waste Regulatory Act of 1990.

A7.12.H. If radioactive materials are employed, facilities should be available for long-term storage and disposal of these materials. No special provisions will normally be required for body waste products from most patients receiving low level isotope diagnostic material. Requirements of authorities having jurisdiction should be verified.

A7.13.D. An area for teaching daily living activities should be provided. It should also contain an area for a bed, kitchen counter with appliances and sink, bathroom, and a table/chair. The facilities should be similar to a residential environment.

A7.14. The unit should comply with the requirements of the Association for Advancement of Medical Instrumentation (AAMI) and the Health Care Finance Administration (HCFA).

A7.14.A2. The location should offer convenient access for outpatients. Accessibility to the unit from parking and public transportation should be a consideration.

A7.14.A3. Space and equipment should be provided as necessary to accommodate the operational narrative, which may include acute (inpatient services) and chronic cases, home treatment and kidney reuse facilities. Inpatient services (acute) may be performed in critical care units and designated areas in the hospital, with appropriate utility.

A7.15.B. Appropriate local exhaust ventilation (LEV) should be provided if glutaraldehyde or other noxious disinfectants are used in the cleaning process. Areas typically used for noxious disinfectants where LEV would be needed include respiratory therapy, endoscopy, central sterile processing, dialysis, and other surgical utility rooms. Position of LEV should be as close to source of hazardous gases/vapors as possible, such as placement of exhaust grill on wall at countertop height directly behind basin or sink where disinfectant will be used.

A7.16.A2. Autopsy rooms should be equipped with downdraft local exhaust ventilation.

A7.16.C. Provision for a separate viewing room is recommended. This room should be in a separate location from the body holding/refrigeration room. This allows the room to be used as a viewing/grieving area.

A7.17.A. The Pharmacy Code requires a minimum area of 150 square feet (13.9 square meters).

A7.18. Dietary Facilities

A7.18.A. General

Food service facilities and equipment should conform with these standards and with the standards of the National Sanitation Foundation and other appropriate codes and should provide food service for staff, visitors, inpatients, and outpatients, as may be appropriate.

Consideration may also be required for meals to VIP suites, and for cafeterias for staff, ambulatory patients, and visitors, as well as providing for nourishments and snacks between scheduled meal service.

Patient food preparation areas should be located in an area adjacent to delivery, interior transportation, storage, etc.

Finishes in the dietary facility should be selected to ensure cleanability and the maintenance of sanitary conditions.

A7.18.B. Functional Elements

If on-site conventional food service preparation is used, the following in size and number appropriate for approved function should be provided.

A7.18.B1. Receiving/control stations. Provide an area for the receiving and control of incoming dietary supplies. This area should be separated from the general receiving area and should contain the following: a control station and a breakout for loading, uncrating, and weighing supplies.

A7.18.B2. Storage spaces. They should be convenient to the receiving area and should be located to exclude traffic through the food preparation area to reach them. Storage spaces for bulk, refrigerated, and frozen foods should be provided. A minimum of four days' supplies should be stocked. (In remote areas, this number may be increased to accommodate length of delivery in emergencies.)

Food storage components should be grouped for convenient access from receiving and to the food preparation areas.

All food should be stored clear of the floor. Lowest shelf should be not less than 12 inches (30 cm) above the floor or should be closed in and sealed tight for ease of cleaning.

A7.18.B3. Cleaning supplies storage. Provide a separate storage room for the storage of non-food items, such as cleaning supplies, that might contaminate edibles.

A7.18.B4. Additional storage rooms. They should be provided as necessary for the storage of cooking wares, extra trays, flatware, plastic and paper products, and portable equipment.

A7.18.B5. Food preparation work spaces. Provide work spaces for food preparation, cooking, and baking. These areas should be as close as possible to the user (i.e., tray assembly and dining). Provide additional spaces for thawing and portioning.

A7.18.B6. Assembly and distribution. Provide a patient tray assembly area and locate within close proximity to the food preparation and distribution areas.

A7.18.B7. Food service carts. A cart distribution system should be provided with spaces for storage, loading, distribution, receiving, and sanitizing of the food service carts. The cart traffic should be designed to eliminate any danger of cross-circulation between outgoing food carts and incoming, soiled carts, and the cleaning and sanitizing process. Cart circulation should not be through food processing areas.

A7.18.B8. Dining area. Provide dining space(s) for ambulatory patients, staff, and visitors. These spaces should be separate from the food preparation and distribution areas.

A7.18.B9. Vending services. If vending devices are used for unscheduled meals, provide a separate room that can be accessed without having to enter the main dining area. The vending room should contain coin-operated machines, bill changers, a handwashing fixture, and a sitting area. Facilities for the servicing and sanitizing of the machines should be provided as part of the food service program of the facility.

A7.18.B10. Area for receiving, scraping, and sorting soiled tableware should be adjacent to ware washing and separate from food preparation areas.

A7.18.B11. Ware washing facilities.

They should be designed to prevent contamination of clean wares with soiled wares through cross-traffic. The clean wares should be transferred for storage or use in the dining area without having to pass through food preparation areas.

A7.18.B12. Pot washing facilities, including multi-compartmented sinks of adequate size for intended use, should be provided convenient to using service. Supplemental heat for hot water to clean pots and pans may be by booster heater or by steam jet.

Mobil carts or other provisions should be made for drying and storage of pots and pans.

A7.18.B13. Waste storage room

A food waste storage room should be conveniently located to the food preparation and ware washing areas, but not within the food preparation area. It should have direct access to the hospital's waste collection and disposal facilities.

A7.18.B14. Handwashing

Fixtures that are operable without the use of hands should be located conveniently accessible at locations throughout the unit.

A7.18.B15. Office spaces

Offices for the use of the food service manager should be provided. In smaller facilities, this space may be located in an area that is part of the food preparation area.

A7.18.B16. Toilets and locker spaces

Spaces should be provided for the exclusive use of the dietary staff. They should not open directly into the food preparation areas, but must be in close proximity to them.

A7.18.B17. Housekeeping rooms

They should be provided for the exclusive use of the dietary department and should contain the following: a floor sink and space for mops, pails, and supplies. Where hot water or steam is used for general cleaning, additional space within the room should be provided for the storage of hoses and nozzles.

A7.18.B18. Icemaking equipment

It should be of a type that is convenient for service and easily cleaned. It should be provided for both drinks and food products (self-dispensing equipment), and for general use (storage-bin type equipment).

A7.18.B19. Commissary or contract services from other areas

Items above may be reduced as appropriate. Provide for protection of food delivered to insure freshness, retention of hot and cold, and avoidance of contamination. If delivery is from outside sources, provide protection against weather. Provisions must be made for thorough cleaning and sanitizing of equipment to avoid mix of soiled and clean.

A7.18.C. Equipment

Mechanical devices should be heavy-duty, suitable for use intended, and easily cleaned. Where equipment is movable provide heavy-duty locking casters. If equipment is to have fixed utility connections, the equipment should not be equipped with casters. Walk-in coolers, refrigerators, and freezers should be insulated at floor, as well as at walls and top. Coolers and refrigerators should be capable of maintaining a temperature down to freezing. Freezers should be capable of maintaining a temperature of 20 degrees below 0 F. Coolers, refrigerators, and freezers should be thermostatically controlled to maintain desired temperature settings in increments of 2 degrees or less. Interior temperatures should be indicated digitally so as to be visible from the exterior. Controls should include audible and visible high and low temperature alarm. Time of alarm should be automatically recorded.

Walk-in units may be lockable from outside but must have release mechanism for exit from inside at all times. Interior should be lighted. All shelving should be corrosion resistant, easily cleaned, and constructed and anchored to support a loading of at least 100 pounds per linear foot.

All cooking equipment should be equipped with automatic shut off devices to prevent excessive heat build-up.

Under-counter conduits, piping, and drains should be arranged to not interfere with cleaning of floor below or of the equipment.

A7.18.D. Plumbing

Provide removable stainless steel mesh in addition to grilled drain cover to prevent entry of large particles of waste, which might cause stoppages. No plumbing lines may be exposed overhead or on walls where possible accumulation of dust or soil may create a cleaning problem or where leaks would create a potential for food contamination.

All handwash facilities should be usable without need to interrupt any services.

A7.18.E. Hoods and Venting Equipment

Hoods and venting equipment should meet the requirements of NFPA 96.

A7.21.B. Clean Assembly/Workroom

Access to sterilization room should be restricted. This room should contain Hi-Vacuum or gravity steam sterilizers and sterilization equipment to accommodate heat-sensitive equipment (ETO sterilizer and ETO aerators). This room is used exclusively for

the inspection, assembly, and packaging of medical/surgical supplies and equipment for sterilization. Area should contain work tables, counters, a handwashing fixture, storage facilities for backup supplies and instrumentation and a drying cabinet or equipment. The area should be spacious enough to hold sterilizer carts for loading of prepared supplies for sterilization.

A7.27.D. Storage for solvents and flammable liquids should follow NFPA 30 "Flammable and Combustible Liquids" or NFPA 56C for labs.

A7.28.A20.

a. Boiler rooms should have ceiling clearances not less than 2 feet 6 inches (76.2 cm) above the main boiler header and connecting piping.

b. Ceilings in radiographic, operating and delivery rooms, and other rooms containing ceiling-mounted equipment or ceiling-mounted surgical light fixtures should be of sufficient height to accommodate the equipment or fixtures and their normal movement.

A7.28.A27. When any equipment or furniture is installed which will be difficult to clean, the facility should be required to submit a step-by-step cleaning procedure for approval.

A7.28.B4. Aesthetic considerations related to stains and odor control support recommendations to avoid carpeting in areas of frequent spillage or heavy soilage (e.g., OR, obstetrics, ICUs, kitchens, laboratories, chemotherapy units, toilet rooms, utility rooms, or specific pediatric areas).

A7.29.F. Provisions for Disasters (See also Section 1.4.)

A7.29.F1. An emergency-radio communication system should be provided in each facility. This system should operate independently of the building's service and emergency power systems during emergencies. The system should have frequency capabilities to communicate with state emergency communication networks. Additional communication capabilities will be required of facilities containing a formal community emergency-trauma service or other specialty services (such as regional pediatric critical care units) that utilize staffed patient transport units.

A7.29.F2. Unless specifically approved, hospitals should not be built in areas subject to damage or inaccessibility due to natural floods. Where facilities may be subject to wind or water hazards, provision should be made to ensure continuous operation.

A7.30.B2. In new construction, hospital-type elevator cars should have inside dimensions for accommodating a patient bed with attendants and equipment. Bed sizes vary depending on the type of patient served and the accessories attached to the bed. Therefore, the inside clear cab dimensions and door width should accommodate the most size-demanding type of patient bed, equipment, and staff determined by the operational narrative.

A7.30.B5. This is so that the light control feature will be overridden or disengaged should it encounter smoke at any landing.

A7.30.C2. The Medical Waste Regulatory Act of 1990, Act No. 368 of the Public Acts of 1978, as amended, Part 138, Medical Waste, regulates disposal of medical waste.

A7.30.C2.d. When incinerators are used, consideration should be given to the recovery of waste heat from on-site incinerators used to dispose of large amounts of waste materials.

A7.30.C2.e. Incinerators should be designed in a manner fully consistent with protection of public and environmental health, both on-site and off-site, and in compliance with federal, state and local statutes and regulations. Toward this end, permit applications for incinerators and modifications thereof should be supported by Environmental Assessments and/or Environmental Impact Statements (EISs) and/or Health Risk Assessments (HRAs), as may be required by regulatory agencies. Except as noted below, such assessments should utilize standard U.S. EPA methods, specifically those set forth in U.S. EPA Guidelines, and should be fully consistent with U.S. EPA Guidelines for health risk assessment (U.S. EPA). Under some circumstances, however, regulatory agencies having jurisdiction over a particular project may require use of alternative methods.

A7.31.A1. The mechanical system should be designed for overall efficiency and appropriate life cycle cost. Details for cost-effective implementation of design features are interrelated and too numerous (as well as too basic) to list individually. Recognized engineering procedures should be followed for the most economical and effective results. A well-designed system can generally achieve energy efficiency at minimal additional cost and simultaneously provide improved patient comfort. Different geographic areas may have climatic and use conditions that favor one system over another in terms of overall cost and efficiency. In no case should patient care or safety be sacrificed for conservation.

Mechanical, electrical, and HVAC equipment may be located either internally, externally, or in separate buildings.

A7.31.A2. Remodeling and work in existing facilities may present special problems. As practicality and funding permit, existing insulation, weather stripping, etc., should be brought up to standard for maximum economy and efficiency. Consideration should be given to additional work that may be needed to achieve this. Heating, ventilating, and air conditioning systems should meet the needs of the facility and the design requirements in Tables 2A and 2B. Existing lined supply air ducts serving the remodeled areas should be replaced with new unlined supply air ducts. The remodeled areas of the existing facility should be brought up to energy efficient standards, such as insulation and thermal pane windows.

A7.31.A3. Facility design consideration should include site, building mass, orientation, configuration, fenestration, and other features relative to passive and active energy systems.

A7.31.A4. Insofar as practical, the facility should include provisions for recovery of waste cooling and heating energy (ventilation, exhaust, water and steam discharge, cooling towers, incinerators, etc.).

A7.31.A5. Facility design consideration should include recognized energy-saving mechanisms such as variable-air-volume systems, load shedding, programmed controls for unoccupied periods (nights and weekends, etc.) and use of natural ventilation, site and climatic conditions permitting. Systems with excessive installation and/or maintenance costs that negate long-range energy savings should be avoided.

A7.31.A6. Air-handling systems should be designed with an economizer cycle, where appropriate, to use outside air. (Use of mechanically circulated outside air does not reduce need for filtration.)

A7.31.A7. Mechanical equipment, ductwork, and piping should be mounted on vibration isolators, as required to prevent unacceptable structure-borne vibration. Air handling units should be designed with appropriate traps, appropriately sized drains or other engineered systems to prevent problems with excess water and flooding of units.

A7.31.B3. Insulation/lining, including finishes and adhesives on the exterior surfaces of ducts, piping, and equipment, should have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as determined by an independent testing laboratory consistent with NFPA 255. The smoke development rating for pipe insulation should not exceed 150. This includes mechanical refrigeration and distribution equipment such as valves, pumps, chillers, etc.

A7.31.B4. These linings (including coatings, adhesives, and exterior surface insulation on pipes and ducts in spaces used as air supply plenums) should have a flame-spread rating of 25 or less and a smoke-developed rating of 50 or less, as determined by an independent testing laboratory consistent with NFPA 255. HVAC linings including coatings, adhesives, and exterior surface insulation on pipes and ducts in spaces used as supply plenums, should have a flame spread rating of 25 or less and a smoke-developed rating of 50 or less consistent with NFPA 255.

A7.31.C1. The capacity of the remaining boiler(s) should be sufficient to provide hot water service for clinical, dietary, and patient use, steam for sterilization and dietary purposes, and heating for operating, delivery, birthing, labor, recovery, intensive care, nursery, and general patient rooms. However, reserve capacity for facility space heating is not required in geographic areas where a design dry-bulb temperature of 25ºF (-4ºC) or more represents not less than 99 percent of the total hours in any one heating month, as noted in ASHRAE's Handbook of Fundamentals, under the "Table for Climatic Conditions for the United States."

A7.31.D1. Private patient rooms may be provided with temperature control adjustments near the bed area, accessible to the patient.

A7.31.D2. Exhaust systems may be combined to enhance the efficiency of recovery devices required for energy conservation. Exhaust air from isolation rooms should not be connected to local exhaust systems. Local exhaust systems should be used whenever possible in place of dilution ventilation to reduce exposure to hazardous gases, vapors, fumes, or mists.

A7.31.D3. Prevailing winds and/or proximity to other structures may require greater clearances.

Note that a 25-foot separation of outdoor air intakes from exhaust outlets is a minimum. Greater distances may be needed where the possibility exists for entrainment of exhaust from emergency generators, ambulance areas, etc.

A7.31.D5. Air handling equipment equipped with air cooling coils should be provided with drain pans to collect the condensation from the coils. Condensate drains should be piped to the outside of the air handling units. All individual condensate drains should be provided with traps which should then be piped to discharge into the nearest drain. The depth of the condensate drain traps should be sufficient to overcome the operating static pressure of the air handling unit.

A7.31.D6. See ACGIH Industrial Ventilation: A Manual of Recommended Practice for additional information.

Acceptable concentrations of anesthetizing agents are unknown at this time. The absence of specific data makes it difficult to set specific standards. However, any scavenging system should be designed to remove as much of the gas as possible from the room environment. It is assumed that anesthetizing equipment will be selected and maintained to minimize leakage and contamination of room air.

A7.31.D9. One way to achieve basic humidification may be accomplished by a steam-jacketed manifold-type humidifier, with a condensate separator that delivers high-quality steam. Additional booster humidification (if required) should be provided by steam-jacketed humidifiers for each individually controlled area. Steam to be used for humidification may be generated in a separate steam generator. The steam generator feedwater may be supplied either from soft or reverse osmosis water. Provisions should be made for periodic cleaning.

Use of steam-to-steam heat exchangers is recommended for steam humidification. This type of system prevents introducing harmful boiler additives into HVAC from direct steam injection because the boiler steam is used to generate clean steam from water without any chemical additives. Electrical steam generation is also possible to produce clean steam.

If direct steam injection of boiler steam is used to provide humidification, then only FDA-approved boiler additives can be used in the boilers.

A7.31.D11. Ducts that penetrate construction intended to protect against X-ray, magnetic, RFI, or other radiation should not impair the effectiveness of the protection.

A7.31.D14. Design and installation of ventilation equipment for toxic substances should ensure compliance with EPA and/or Michigan Department of Environmental Quality Regulations concerning fugitive air emissions, air permits, and other applicable environmental health and safety regulations. Typical sources of air emissions in health care facilities include incinerators, boilers, and ethylene oxide sterilizers.

A7.31.D15. Consider using variable volume laboratory fume hoods where multiple hoods are located in a space or area. A flow tracking system is recommended that will allow the space make-up air to be controlled to maintain the room negative pressure and maintain the appropriate air change rate at all times. A minimum laboratory fume hood inflow rate of 25 percent of maximum inflow rate is recommended, when hood sash is fully closed.

A7.31.D24. When not performed in an airborne infection isolation room, sputum induction should be performed in an enclosed booth, with a mechanical ventilation system capable of providing at least 20 air changes per hour. The exhaust rate should be at least 50 cfm, and the space should be under negative pressure (at least 0.001" water column). The booth should contain a grille to provide make-up air that should enter with a velocity of at least 100 fpm. All air should be exhausted directly to the outside. HEPA filtration of the exhaust may be required, if the exhaust point is near an outside air intake, or pedestrian area.

A7.31.E4.c. Insofar as possible, drainage piping should not be installed within the ceiling or exposed in operating and delivery rooms, nurseries, food preparation centers, food serving facilities, food storage areas, central services, electronic data processing areas, electric closets, and other sensitive areas. Where exposed, overhead drain piping in these areas is unavoidable, special provisions should be made to protect the space below from leakage, condensation, or dust particles.

A7.31.E4.e. Floor drains in cystoscopy operating rooms have been shown to disseminate a heavily contaminated spray during flushing. Unless flushed regularly with large amounts of fluid, the trap tends to dry out and permit passage of gases, vapors odors, insects and vermin directly into the operating room. For new construction, if a floor drain is insisted upon by the users, the drain plate should be located away from the operative site, and should be over a frequently flushed nonsplash, horizontal-flow type of bowl, preferably with a closed system of drainage. Alternative methods include (a) an aspirator/trap installed in a wall connected to the collecting trough of the operating table by a closed, disposable tube system, or (b) a closed system using portable collecting vessels. (See NFPA 99).

A7.32.A2. The electrical installations, including alarm, nurse call, and communication systems should be tested to demonstrate that equipment installation and operation is appropriate and functional. A written record of performance tests on special electrical systems and equipment should show compliance with applicable codes and standards. In addition to this testing, the electrical design professional shall conduct and submit to the owner and local authority having jurisdiction, the following studies in accordance with the 1996 InterNational Electrical Testing Association Guidelines: 6.4 Short Circuit Study, 6.5 Equipment Evaluation Study and 6.6 Protective Device Coordination Study.

A7.32.A3. A design should be provided such that power sources such as shielded isolation transformers, voltage regulators, filters, and the like are not required elements of the design. Ensure that the equipment meets the appropriate IEEE and ANSI standards.

A7.32.D6. Light intensity for staff and patient needs should generally comply with health care guidelines set forth in the IES publication. Consideration should be given to controlling intensity and/or wavelength to prevent harm to the patient's eyes (i.e., retina damage to premature infants and cataracts due to ultraviolet light).

Many procedures are available to satisfy lighting requirements, but the design should consider light quality as well as quantity for effectiveness and efficiency. While light levels in the IES publication are referenced herein, those publications include other useful guidance and recommendations which the designer is encouraged to follow.

A7.32.D7. Consideration should be given to the special needs of the elderly. Excessive contrast in lighting levels that make effective sight adaptation difficult should be minimized.

A7.32.E1. It is the intent of this section to prohibit the use of "portable plug strips," extension cords and the like in the acute health care setting.

A7.32.E2. The duplex receptacle on each side of the head of each bed location should be at a level not less than 36 inches and not more than 54 inches above the finished floor. At least one of these receptacles should be connected to the Essential Electrical System. There should also be a receptacle at the head of each bed location for the purposes of powering the bed. Additionally, there should be not less than one receptacle on each wall located 18″ above the finished floor. Additional receptacles required for dedicated television outlets or other such "resident" equipment should not be counted as being one of these receptacles. Where existing construction or design makes the placement of these receptacles impractical, they may be omitted through the approval of the authority having jurisdiction.

A7.32.F6. Special equipment is identified in the following sections: Critical Care Units, Newborn Nurseries, Pediatric and Adolescent Unit, Psychiatric Nursing Unit, Surgical Suites, Obstetrical Suite, Emergency Service, Imaging Suite, Nuclear Medicine, Laboratory Suite, Rehabilitation Therapy Department, Renal Dialysis Unit, Respiratory Therapy Service, Morgue, Pharmacy, Dietary Facilities, Administration and Public Areas, Medical Records, Central Services, General Stores, and Linen Services.

These sections should be consulted to ensure compatibility between programmatically defined equipment needs and appropriate power and other electrical connection needs.

A7.32.F7. There should be special attention paid to safety hazards associated with equipment cabling. Every attempt should be made to minimize these hazards, where practical.

A7.32.G9. Alternate technologies can be considered for emergency or nurse call systems. If radio frequency systems are utilized, consideration should be given to electromagnetic compatibility between internal and external sources.

A7.32.H. Emergency power may be supplied from a "cogeneration" unit(s) provided the following requirements are met:

1. The cogeneration unit(s) can be brought on line within the time determined by NFPA 99 for Type I systems. Where the portion of the Essential Electrical System being served by this unit(s) is exclusively under a "delayed" reconnection, this provision may be waived.

2. Where the cogeneration unit(s) are to be used as the emergency source, at the time of a failure of the "normal" source, the cogeneration unit(s) should immediately disconnect from the "normal" source and transfer to the "emergency" mode.

3. Fuel for the cogeneration unit(s) should have an "on-site" supply as deemed appropriate by NFPA 99. Where natural gas is used as the prime firing source, a dual fired combustor using an "on-site" fuel should be installed as part of the cogeneration unit. This requirement may be waived by the authority having jurisdiction where it is deemed that the natural gas supply is reliable.

4. Where more than one cogeneration unit feeds the site, they should not be the sole source of normal power for the facility unless there is "reserved" capacity available through the electrical utility for the site.

The reliance on emergency power in healthcare facilities continues to increase. Equipment and electrical systems on emergency power are escalating equally as fast. It is no longer unusual to find the patient care information system on emergency power.

Because of this increasing demand and reliance on emergency power, it is incumbent on the electrical system designer to anticipate the effect on the healthcare facility of scheduled and unscheduled downtime of the emergency power system.

Consideration should be based upon a risk assessment for each facility. Some facilities may choose a dual electrical buss system, while others may choose to stock critical components. In many cases, the minimum emergency power requirements will be adequate. Regardless of the options, the designer should provide the healthcare facility with the merits and perils of each.

To enable facilities to continue with complex and/or emergency procedures in the surgical suite, a minimum of 10 percent of the operating rooms should be served by an HVAC system which is connected to emergency power.

A7.32.I. Fire Alarm

All health care occupancies should be provided with a fire alarm system consistent with NFPA 101 and NFPA 72.

Table 2, Footnote 6. Recirculating devices with HEPA filters may have potential uses in existing facilities as interim, supplemental environmental controls to meet requirements for the control of airborne infectious agents. Limitations in design must be recognized. The design of either portable or fixed systems should prevent stagnation and short circuiting of airflow. The supply and exhaust locations should direct clean air to areas where health care workers are likely to work, across the infectious source, and then to the exhaust, so that the health care worker is not in position between the infectious source and the exhaust location. The design of such systems should also allow for easy access for scheduled preventative maintenance and cleaning.

A8.1.B. Ancillary Services

When the nursing facility is part of, or contractually linked with, another facility, services such as dietary, storage, pharmacy, linen services, and laundry may be shared insofar as practical. In some cases, all ancillary service requirements will be met by the principal facility and the only modifications necessary will be within the nursing facility. In other cases, programmatic concerns and requirements may dictate separate services.

A8.1.C. Hospital Conversions

While there are similarities in the spatial arrangement of hospitals and nursing facilities, the service requirements of long-term care residents will require additional special design considerations. When a section of an acute-care facility is converted, it may be necessary to reduce the number of beds to provide space for long-term care services. Design should maximize opportunities for ambulation and self-care, socialization, independence, and minimize the negative aspects of an institutional environment.

A8.2.A. Clusters and Staffing Considerations

Clustering refers to several concepts wherein the design of traditional nursing home floor plans (straight halls, double or single loaded corridors) is reorganized to provide benefits to both residents and to the effectiveness with which people care for them. Clustering is done to achieve better image, faster service, shorter walking/ wheeling distances, and more subtle handling of linen. It can also afford more localized social areas and optional decentralized staff work areas. A functioning cluster, as described here, is more than an architectural form where rooms are grouped around social areas without reference to caregiving. In a functioning cluster, the following will be accomplished:

Utility placement is better distributed for morning care: Clean and soiled linen rooms are located closer to the resident rooms, minimizing staff steps and maximizing the appearance of corridors (carts are not scattered through halls).

Unit scale and appearance reinforces smaller groups of rooms seen as being grouped or related: Clusters should offer identifiable social groups for both staff and older people, thereby reducing the sense of largeness often associated with centralized facilities.

Geographically effective staffing: The staffing pattern and design reinforce each other so that nursing assistants can offer primary nursing care and relate to a given set of rooms. Their room assignments are grouped together and generally do not require unequal travel distances to basic utilities. Staff "buddying" is possible. Buddying involves sharing responsibilities, such as lifting a non-weight bearing person, or covering for someone while the buddy provides off-unit transport, or is on a break.

Staffing that works as well at night as during the day: An effective cluster design incorporates multiple staffing ratios. A unit might have 42 beds, but with clustering, could staff effectively in various ratios of licensed nurses to nurses assistants: 1:7 days (6 clusters); 1:14 or 1:21 nights (3 or 2 neighborhoods).

Clustering can also have some other benefits:

Cluster design can provide more efficient "gross/net area" when a variety of single and/or double rooms are "nested."

Cluster design can be useful when a project is to have a high proportion of private occupancy rooms, because it reduces distances to staff work areas or nursing stations.

Clusters provide a method of distributing nursing staff through a building, nearer to bedrooms at night, so they can be responsive to vocal calls for assistance and toileting. (Central placement of staff requires greater skill in using traditional call systems than many residents possess.)

Cluster units of a given size may "stack" or be placed over each other, but might have different staffing for varying care levels.

If digital call systems are used (such as those allowing reprogramming of what room reports to which zone or nursing assistant's work area), then one unit might easily be changed over time, such as when client needs justify higher ratios of nursing assistants to older people. For example, a 48-bed unit might start at 1:8 staffing, but also respond to 1:6 staffing needs. In some units, staffing might also be slightly uneven, such as where 60-bed units are comprised of clusters of 1:7 and 1:8 during days.

Architectural Form and Clustering

Clusters involve architectural form and may have an impact on overall building shape. The longer length of stay of nursing home residents compared with hospital clients is one factor that makes clustering rooms in more residential groups particularly appropriate. However, the visual advantages of units without long corridors has also attracted hospital planners. In both facility types, architectural clustering may help both staff and residents socially identify a space or sub-unit within a larger unit.

Though architectural clustering may involve grouping rooms, this should not happen at the expense of windowless social areas, or the incorporation of all social options in a windowless social area directly outside of the bedroom doorways.

A8.2.B2. Room size (area and dimensions) should be determined by analyzing the needs of the resident(s) to move about the room in a wheelchair, gain access to at least one side of his or her bed, turn and wheel around the bed, to gain access to a window and to the resident’s toilet room, wardrobe locker, or closet, and to the resident’s possessions or equipment, including chair, dresser, and night stand.

A8.2.B11. If an airborne infection isolation room is required by the infection control risk assessment, the ventilation system for the single-bed resident room should be designed to meet airborne infection isolation requirements. If an airborne infection isolation room is not required, the ventilation system for the single-bed room can be designed as for any other resident sleeping room.

A8.2.C. The size and location of each service area will depend upon the numbers and types of beds served. Identifiable spaces are required for each of the indicated functions. Each service area may be arranged and located to serve more than one resident module but, unless noted otherwise, at least one such service area should be provided on each nursing floor. Where the words room or office are used, a separate, enclosed space for the one named function is intended; otherwise, the described area may be a specific space in another room or common area.

A8.2.C1. Whether centralized or decentralized, staff work areas should be designed to minimize the institutional character, command-station appearance, and noise associated with traditional medical nursing stations, and should foster close, open relationships between residents and staff. Confidentiality or noisy staff conversations should be accommodated in an enclosed staff lounge and/or conference area. At least part of each staff work area should be low enough and open enough to permit easy conversations between staff and residents seated in wheelchairs.

Depending upon the type of service and care plan to be provided, direct care staff work areas need not be encumbered with all of the provisions for a supervisory administrative staff work area. In some decentralized arrangements, care-giving functions may be accommodated at a piece of residential furniture (such as a table or a desk) or at a work counter recessed into an alcove off a corridor or activity space, with or without computer and communications equipment, storage facilities, etc.

A8.2.C9. Ice-makers should be located, designed and installed to minimize noise, and may serve more than one nourishment station).

A8.3.A. Area Need

The space needed for dining and recreation should be determined by considering (a) needs of residents to use adaptive equipment and mobility aids and receive assistance from support and service staff, and (b) the extent to which support programs should be centralized or decentralized, as required by the operational narrative. It is important to provide outdoor views from dining, recreation, and living spaces.

Nothing in these guidelines is intended to restrict a facility from providing additional square footage per resident beyond what is required herein for dining rooms, activity areas and similar spaces.

A8.4. Activities programs focus on the social, spiritual and creative needs of residents and clients and provide quality, meaningful experiences for them. These programs may be facility-wide or for smaller groups. The Activities Department is generally responsible for coordination of activities for large and small groups and personalized individual programs involving one resident and one therapist. These activities may be conducted in other portions of the building (i.e., dining rooms, recreation spaces, lounges, etc.), but dedicated spaces are preferred for efficient operation of quality programs. Large space requirements

(e.g., libraries, chapels, auditoria, conference, classroom and/or training spaces) are dependent upon the programming decisions of the sponsors, as reflected in the operational narrative for the facility.

A8.4.B1. If required by the operational narrative , include space for files, records, computers, and administrative activities, a storage space for supplies and equipment, and a quiet space for residents to maximize conversations. This quiet space may be incorporated within space for administrative activities.

Note: Hearing loss in the elderly is well documented. Quiet space is very important to enable conversation.

A8.4.B2. Nothing in these guidelines is intended to restrict a facility from providing additional square footage per resident beyond what is required herein for activities.

A8.6. Consideration should be given to the special ventilation and exhaust requirements of these areas.

A8.7. This text is included in the appendix to solicit future public proposals to help the committee develop minimum guidelines for this service and facility type.

Subacute Services: Struggling to Define the Continuum

Most observers consider subacute care a loophole in the prospective payment system. So, it comes as no surprise that health care providers eagerly initiate discussion about this nontraditional level of care. However, these discussions have become the source of much conflict as each provider group works to create its own concept of subacute services.

Exceptions can be found to any definition of subacute care, which is also called transitional care, post-acute care, and skilled care, depending on the type of provider. Only if a separate definition is developed for each type of provider does a clear definition of subacute services begin to emerge.

With that in mind, groups seeking to develop subacute services must agree on a working definition for their organization. Currently, subacute services are found in four types of facilities, each of which has a different model of care for a different patient mix. These include: acute care hospitals, rehabilitation hospitals, nursing homes, and subacute facilities.

Acute care hospitals generally provide subacute services in a physically distinct unit with beds certified by Medicare as skilled nursing facility (SNF) beds. The unit is used for patients who continue to require medical supervision at a higher level than that provided for nursing home patients, but less than that required in a medical/surgical bed.

Rehabilitation hospitals may provide subacute care to several different patient groups. Patients who are ready for discharge from an acute care hospital, but who do not meet the admissions criteria for intensive rehabilitation, may receive subacute care at a rehabilitation hospital. Others may be admitted for a short stay during which rehabilitation services are provided, but not at the intensity provided to those admitted for acute rehabilitation services. Finally, patients who have completed an intensive rehabilitation program may

receive subacute services when they no longer need the same intensity of therapies, but are not yet ready for discharge home.

A significant shift is noted among nursing homes to provide more skilled nursing and rehabilitation services than those traditionally found at these facilities. Distinct units are certified by Medicare as SNFs. Diagnoses are similar to those found in a SNF in an acute care hospital; however, because of the differences in overhead, care can be provided at markedly lower costs.

Specialty subacute facilities are the newest players on the block. These are generally developed by entrepreneurs capitalizing on a unique and profitable niche in the health care industry. They may be licensed as acute care hospitals or as specialty hospitals. Patients generally represent those who require intensive care services for an extended period, including catastrophic illness and post-surgery. These patients are classified as subacute because of the long-term nature of their acute medical conditions.

A8.8.A. The latest edition of the Life Safety Code recognizes the need to lock doors in Alzheimer's units. Consideration should be given to making locks on wardrobes, closets, or cupboards inconspicuous.

A8.8.B. Outdoor spaces may include gardens on grade or on roof decks, or solaria, porches, balconies, etc. Lounge space may be a winterized sun room, a designated lounge space separate from the dining room, or a day room, where other residents may be sitting. Secure, accessible outdoor space can provide a calming change in environment and also a convenient place for agitated residents to walk.

A8.8.C. Activity space for resident use in dementia programs shall be provided.

Major characteristics of persons with Alzheimer's and other dementias are lack of attention span and an inability to orient themselves within space. The environment should provide attention-grabbing landmarks, wayfinding cues and information, to aid in navigation from point to point. Sensory cueing that is used in other long-term care resident areas should be incorporated for persons with dementia. Dementia program activities may include memory stimulation, music therapy, art therapy, horticultural therapy, etc. Space for dining and activities in dedicated dementia units may be provided within the unit, or directly accessible to the residents of the unit, per the minimum standards described elsewhere in Chapter 8.

A8.8.C1. Landmarks: Design elements that provide clear reference points in the environment, i.e., a room, a large three-dimensional object, large picture, or other wall-mounted artifact.

A8.8.C2. Signs: When appropriate, large characters and redundant word/picture combinations should be used on signs.

A8.8.C3. Environmental Design Challenge: Residents with mental impairment often find it difficult to sit for long periods of time or to sit at all without becoming restless. Although it is not a universal trait, it is so common and requires so much staff time that environmental solutions should be explored in all areas, to give cognitively impaired people interesting places and things on which to focus their attention.

A8.14. Resident facilities require features that encourage ambulation of long-term residents, including safe outside space. Signage and wayfinding features should be provided to aid self-ambulating residents and avoid confusing or disorienting them. Potential hazards to residents, such as sharp corners, slippery floors, loose carpets, and hot surfaces should be avoided.

Renovations shall not diminish the level of compliance with these standards below that which existed prior to the renovation. However, features in excess of those for new constructions are not required to be maintained in the completed renovation.

Hot surfaces are intended to include those surfaces to which residents have normal access and exceeding 110°F. This requirement does not intend to include medical or therapeutic equipment.

A8.14.A5. Where local requirements permit, wire-free, fire-rated safety glazing should be used to enhance the home-like residential appearance preferred by residents and visitors.

A8.14.A7. Consideration should be given to increasing clearances for arthritic residents.

A8.14.A8. Consideration should be given to increasing clearances for arthritic residents and for mounting handrails lower than required by ADA, to enable frail residents to lean on the handrails for support while ambulating.

A8.14.A11. Tops and bottoms of the mirror may be at levels usable by individual, either sitting or standing, or additional mirrors may be provided for wheelchair occupants. One separate full-length mirror may serve for wheelchair occupants.

A8.30.B2. Handrail projections of up to 3.5 inches (8.89 cm) should not be construed as diminishing the clear inside dimensions.

A8.31.A1. The mechanical system should be subject to general review for operational efficiency and appropriate life-cycle cost. Details for cost-effective implementation of design features are interrelated and too numerous (as well as too basic) to list individually. Recognized engineering procedures should be followed for the most economical and effective results. A well-designed system can generally achieve energy efficiency with minimal additional cost and simultaneously provide improved resident comfort. In no case shall resident care or safety be sacrificed for conservation.

A8.31.A2. Facility design considerations should include site, building, location, climate, orientation, configuration, and thermal requirements.

A8.31.A3. As appropriate, controls for air-handling systems should be designed with an economizer cycle to use outside air for cooling and/or heating.

A8.31.D1. The ventilation rates shown in Tables 6A and 6B, as applicable, should be used only as minimum standards; they do not preclude the use of higher rates as appropriate. All rooms and areas in the facility should have provision for positive ventilation. (Though natural window ventilation may be utilized where weather and outside air quality permit, use of mechanical ventilation should be considered for interior areas and during periods of temperature extremes. Non-central air-handling systems, e.g., through-the-wall fan coil units, may be utilized.)

(Exhaust systems may be combined to enhance the efficiency of recovery devices required for energy conservation.)

ASHRAE Standard 55 recommends 30 to 60 percent relative humidity for comfort. In cold or arid climates, achieving relative humidities as high as 30 percent may not be practical. Where central ventilation systems are not utilized, these humidity requirements may not be achievable. Additional data are needed to establish a consensus on the cost/benefit of maintaining humidity within the recommended range.

If duct humidifiers are located upstream of the final filters, they should be located at least 15 feet (4.56 meters) upstream of the final filters. Ductwork with duct-mounted humidifiers located downstream of the final filters should have a means of water removal.

An adjustable high-limit humidistat should be located downstream of the humidifier to reduce the potential of condensation inside the duct. All duct takeoffs should be sufficiently downstream of the humidifier to ensure complete moisture absorption. Steam humidifiers should be used.

Exhaust hoods handling grease-laden vapors in food preparation centers should comply with NFPA 96. All hoods over cooking ranges should be equipped with grease filters, fire extinguishing systems, and heat-actuated fan controls. Cleanout openings should be provided every 20 feet (6.10 meters) and at changes in direction in the horizontal exhaust duct systems serving these hoods. (Horizontal runs of ducts serving range hoods should be kept to a minimum.)

A8.31.D8. It is recommended that when practical, ventilation requirements be met by a central air handling system with filtration and humidification provisions. This system may be designed for ventilation only, with heating and cooling accomplished by non-central air handling equipment (e.g., fan coil units, heat pumps, etc.). These non-central units should be equipped with permanent, cleanable or replaceable filters with a minimum efficiency of 25 percent based on ASHRAE 52.1-92 atmospheric dust spot efficiency. For ventilation purposes, these units may be used as recirculating units only.

A8.32.A4.a. The reader should refer to the IES Lighting Handbook and Lighting for Health Care Facilities for additional information.

A8.32.A4.b. Excessive differences in lighting levels should be avoided in transition areas between parking lots, building entrances and lobbies or corridors, in transition zones between driveways and parking garages, etc. As the eye ages, pupils become smaller and less elastic, making visual adaptation to dark spaces slower. Upon entering a space with a considerably

lower lighting level, elderly residents may need to stop or move to one side until their eyes adapt to excessive lighting changes. Elderly pedestrians may need several minutes to adjust to significant changes in brightness when entering a building from a sunlit walkway or terrace.

Consideration should be given to increasing both indoor and outdoor illumination levels in such transition spaces to avoid excessive differences between electric lighting levels and natural daytime and nighttime illumination levels. In addition, it is very helpful for pedestrians to have conveniently-located places to wait, giving them time to adjust their eyes to different lighting environments. Seating areas off busy lobbies or corridors can minimize the potential for accidents by giving them the extra time they need.

Care should be taken to minimize extremes of brightness within spaces and in transitions between spaces. Excessive brightness contrast from windows or lighting systems can disorient residents.

Lighting that creates glare and colors that do not differentiate between horizontal and vertical planes, or between objects and their backgrounds (such as handrails or light switches from walls, hardware from doors, faucets from sinks, or control knobs from appliances) should be avoided, unless therapeutic benefits can be demonstrated. (For example, it has been demonstrated that deliberately camouflaged door hardware may help control wandering and elopements by some cognitively impaired residents in Alzheimer's care facilities.)

A.8.32.A4.c. Care should be taken to avoid injury from lighting fixtures. Light sources that may burn residents or ignite bed linen by direct contact should be covered or protected.

Determination of average illuminance on a horizontal plane from general lighting only. The use of this method in the types of areas described should result in values of average illuminance within 10 percent of the values that would be obtained by dividing the area into 2-foot (0.6-meter) squares, taking a reading in each square and averaging.

The measuring instrument should be positioned so that when readings are taken, the surface of the light sensitive cell is in a horizontal plane and 30 inches (760 mm) above the floor. This can be facilitated by means of a small portable stand of wood or other material that will support the cell at the correct height and in the proper plane. Daylight may be excluded during illuminance measurements. Readings can be taken at night or with shades, blinds or other opaque covering on the fenestration.

8.32.G.(b) Alternate technologies can be considered for emergency or nurse call systems subject to the approval by the authority having jurisdiction.

A8.32.H5. Where a generator is routinely used to reduce peak loads, protection of patient areas from excessive noise may become a critical issue.

Table 6, Footnote 10. Recirculating devices with HEPA filters may have potential uses in existing facilities as interim, supplemental environmental controls to meet requirements for the control of airborne infectious agents. Limitations in design must be recognized. The design of either portable or fixed systems should prevent stagnation and short circuiting of airflow. The supply and exhaust locations should direct clean air to areas where health care workers are likely to work, across the infectious source, and then to the exhaust, so that the health

care worker is not in position between the infectious source and the exhaust location. The design of such systems should also allow for easy access for scheduled preventative maintenance and cleaning.

A9.2.I1. Construction and structural elements of freestanding outpatient facilities shall comply with recognized model-building-code requirements for offices and to the standards contained herein. Outpatient facilities that are an integral part of the hospital or that share common areas and functions shall comply with the construction standards for general hospitals. See applicable sections of this document for additional details.

A9.2.I2. Interior finish materials shall have flame-spread and smoke-production limitations, as described in NFPA 101. Wall finishes less than 4-mil thick applied over a noncombustible material are not subject to flame-spread rating requirements.

A9.2.I3. Building insulation materials, unless sealed on all sides and edges, shall have a flame-spread rating of 25 or less and a smoke-developed rating of 150 or less, when tested consistent with NFPA 255.

A9.2.J. Provision for Disasters

Seismic-force resistance of new construction for outpatient facilities shall comply with Section 1.4. and shall be given an importance factor of one. Where the outpatient facility is part of an existing building, that facility shall comply with applicable local codes. Special design provisions shall be made for buildings in regions that have sustained loss of life or damage to buildings from hurricanes, tornados, floods, or other natural disasters.

A9.7. The birthing center was conceptualized as small (intimate), home-like service units serving a population of healthy childbearing families approaching pregnancy and birthing as a normal family event and seeking care in a safe environment outside of, but with access to, the acute-care hospital setting, when needed. The freestanding birthing center may be a separate outpatient facility.

A9.8. The range of services provided in these facilities is very dynamic and growing, including diagnostic cardiac catheterization, general radiography, fluoroscopy, mammography, CT scanning, magnetic resonance imaging (MRI), ultrasound, radiation therapy, and IV therapies. Facilities may specialize in only one of these areas or may provide a mix of services.

A9.9. The endoscopy suite may be divided into three major functional areas: procedure room(s), instrument processing room(s), and patient holding/preparation and recovery room or area.

A9.9.A1. Wall outlets should be planned to minimize exposed power cords and cables. Monitors should be located for optimal visualization by practitioners.

A9.9.B1. In an optimal situation, cleaning room(s) should be located between two procedure rooms. However, one processing room may serve multiple procedure rooms. Size of the cleaning room(s) is dictated by the amount of equipment to be processed.

Cleaning rooms should allow for flow of instrumentation from the contaminated area to the clean area, and finally, to storage. The clean equipment rooms, including storage, should protect the equipment from contamination.

A10.1. Rehabilitation facilities may be organized under hospitals (organized departments of rehabilitation), outpatient clinics, rehabilitation centers, and other facilities designed to serve either single- or multiple-disability categories including but not limited to: cerebrovascular, head trauma, spinal chord injury, amputees, complicated fractures, arthritis, neurological degeneration, genetic, and cardiac.

In general, rehabilitation facilities will have larger space requirements than general hospitals, have longer lengths of stay, and have less institutional and more residential environments.

A10.24. Patients in a rehabilitation facility will be disabled to differing degrees. Therefore, high standards of safety for the occupants should be provided to minimize accidents.

A12.3. It is recommended that the docking facility for mobile units be level with the floor of the mobile units, that an inflatable weather seal be used to protect patients from moisture, wind, and extreme temperatures, and that both the patient and staff access doors fit within the weather seal.

A12.32.A2. The electrical installations, including alarm, nurse call, and communication systems should be tested to demonstrate that equipment installation and operation is appropriate and functional. A written record of performance tests on special electrical systems and equipment should show compliance with applicable codes and standards.

A12.32.A3. Data processing and/or automated laboratory or diagnostic equipment, if provided, may require safeguards from power line disturbances.